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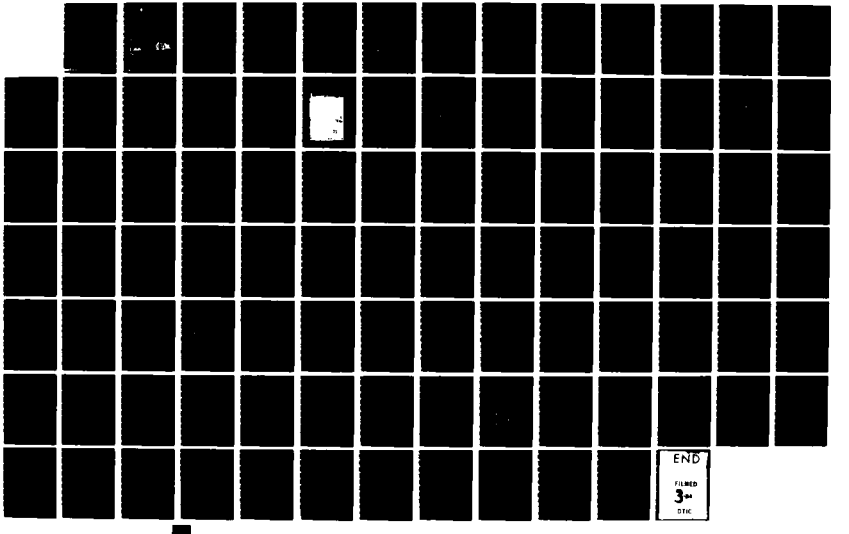

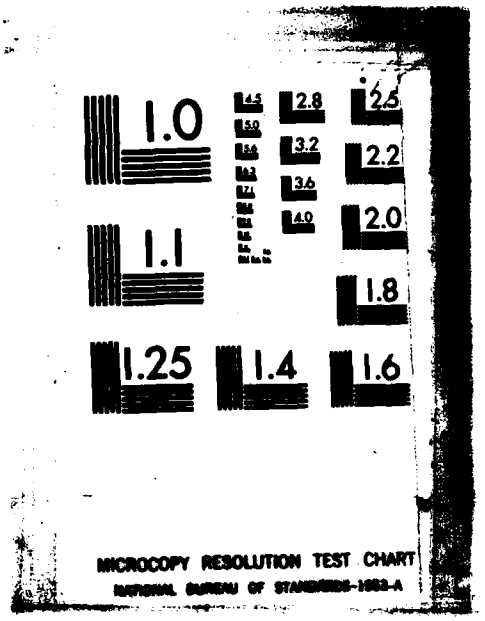
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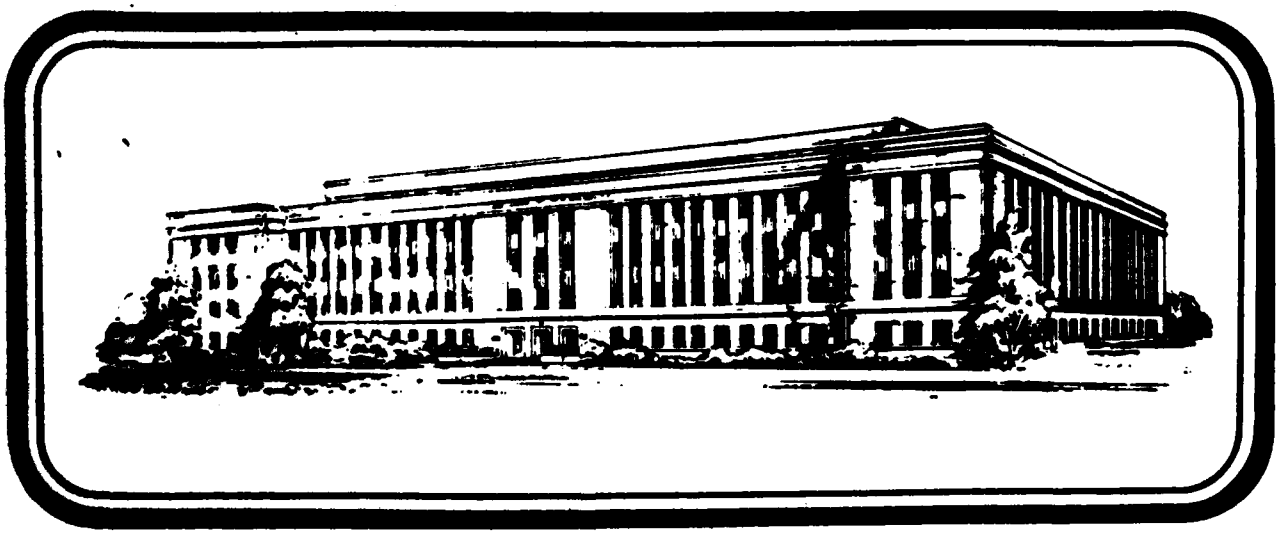
EFFECTIVE INTEGRATION OF FACULTY REQUIREMENTS INTO ARMY SYSTEM ACQUISITION PROGRAMS



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This paper investigates the interfaces between the Army's facilities planning and construction community and the systems acquisition programs to determine (1) If facility requirements for new systems are being anticipated and adequately scoped during research and development (R&D) so facilities required for fielding are available upon deployment and (2) are the planning, programming and budgeting system (PPBS) cycle, the military construction (MILCON) process and the systems acquisition process synchronized to insure availability of facilities for the Army's modernization efforts.

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EFFECTIVE INTEGRATION OF FACILITY REQUIREMENTS INTO ARMY SYSTEM ACQUISITION PROGRAMS

by

GEORGE R. KLEB, COLONEL, USA
CHARLES J. SOLOMUB, COLONEL, USA

A RESEARCH REPORT SUBMITTED TO THE FACULTY
AS
FULFILLMENT OF THE RESEARCH
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RESEARCH SUPERVISOR: MELVIN A. RUNZO, CAPTAIN, USN

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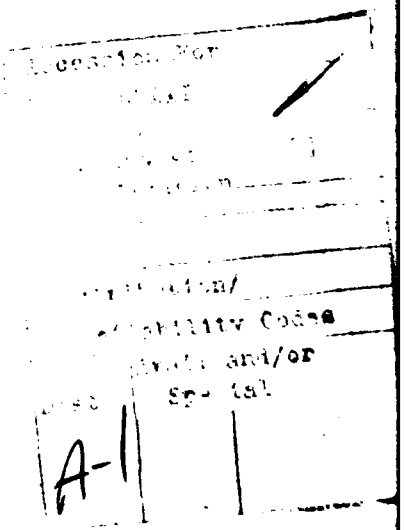

DISCLAIMER-ABSTAINER

This research report represents the views of the authors and does not necessarily reflect the official opinion of the Industrial College of the Armed Forces, The National Defense University, or the Department of Defense.

ABSTRACT OF STUDENT RESEARCH REPORT
INDUSTRIAL COLLEGE OF THE ARMED FORCES

NAME OF RESEARCHER (S)	TITLE OF REPORT
Kleb, George R. Colonel, USA Sollohub, Charles J., Colonel, USA	Effective Integration of Facility Requirements into Army Systems Acquisition Programs
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ABSTRACT

Problem Statement: This paper investigates the interfaces between the Army's facilities planning and construction community and the systems acquisition programs to determine (1) If facility requirements for new systems are being anticipated and adequately scoped during research and developement (R&D) so facilities required for fielding are available upon deployment and (2) are the planning, programming and budgeting system (PPBS) cycle, the military construction (MILCON) process and the systems acquisition process synchronized to insure availability of facilities for the Army's modernization efforts.

Conclusions:

1. Generally, elements of an effective management system are in place to meet objectives.
2. Facility requirements have not in general been anticipated and adequately scoped during new systems R&D.
3. Extraordinary management efforts have been required to meet needs.
4. Management mechanisms are either not developed or not receiving sufficient emphasis to guarantee effective facility requirements development.
5. Significant potential mismatches exist among the PPBS cycle, the MILCON and acquisition processes.
6. Extensive management efforts are necessary to minimize these mismatches.
7. Project managers need to give increased emphasis to development of facility requirements.

Recommendations:

1. Increase efforts to coordinate an integrated management of facility requirements into systems acquisition.
2. Provide increased funding for development of facility requirements for new systems.
3. Create management controls to insure program derived life cycle costs include detailed facility requirements.
4. Increase resource allocation to Management Information System (MIS) support.

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EXECUTIVE SUMMARY

This study analyzes the relationships between the army systems acquisition and facility construction processes to understand how those processes are coordinated and to determine if changes can be made to improve the interaction between them so that the facilities will be there when the systems are fielded.

This study was conducted under the hypothesis that the basic process is in place to anticipate, fund and construct the new facilities which will be required to support new systems when they are fielded. However, since several recently fielded new systems required facilities which had not been anticipated, there may well be some coordination actions which are not receiving enough emphasis or which have fallen into disuse.

The analysis focuses on answering the following questions:

a. Are facility requirements being anticipated and adequately scoped during research and development so that meaningful facility programming guidance can be issued prior to production and deployment?

b. Does the planning, programming and budget cycle for Military Construction Army (MCA), Operations and Maintenance Army (OMA), and Family Housing Management Army (FHMA) mesh with the process for production and fielding of new systems so that the facilities can be funded and constructed when the systems are fielded?

The answers to these questions were sought by extensive interviews throughout the Army staff and major commands, the Office of the Secretary of Defense, and staff of the U.S. Congress and the study of pertinent regulations, plans, reports, letters and other documents.

This study led to the following general conclusions:

a. The Army system for the acquisition of new weapons systems and equipment as well as restructuring of organizations to include the facilities needed to support them is generally capable of anticipating, funding and constructing the new facilities to have them ready when needed.

b. Facility requirements for new systems frequently have not been adequately anticipated and scoped during research and development to insure availability of facilities when the systems are fielded. The result has been the application of extraordinary management effort to overcome deficiencies.

c. Extraordinary management efforts have been necessary to insure availability of facilities when the systems are fielded.

d. Normal management mechanisms are not receiving enough emphasis or are not sufficiently developed to insure timely development of facility requirements.

e. The system acquisition process which is event driven and the construction management process which is time driven have significant potential mismatches.

f. Extensive management efforts are necessary to minimize these mismatches.

g. The project manager is responsible for development of facility requirements, but not for the construction of the facilities. Increased emphasis is needed on the former so that the latter can be accomplished in a timely manner.

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INTRODUCTION

SCOPE

The development and deployment of modern Army systems requires timely facility availability. The Army is now in the midst of the most extensive peacetime force modernization program in its history. More than 400 new systems will be issued to Army field commands over the next several years. Some are improved performance replacements for current systems with little facility impact. Many, although they essentially replace current systems, are sufficiently different in performance, size or maintenance requirements that they impose significant facility requirements on the using commands and the training establishment. Some are completely new systems which impose new facility requirements literally from the ground up.

The problem is complicated by the transition of the Army from its current division organization to the Division 86 configuration and of the field forces to the Army 90 structure. This transition is designed to take advantage of the increased combat effectiveness provided by the new systems. Different units shrink or grow in size or change location in the combat zone with attendant changes in facility needs. In U.S. Army Europe (USAREUR) alone, the projected Military Construction Army (MCA) cost for deployment of the Army Force modernization systems during the period Fiscal Years (FY) 1982-1989 is approximately $2 billion dollars.

A program of this magnitude and complexity demands the closest coordination and cooperation between materiel developers, facility constructors and resource managers from the beginning of concept development through the fielding of new systems to insure that the right facilities are in the right place at the right time.

Although facilities typically represent only 5-10% of life cycle costs for a system, the timely availability of those facilities is just as critical to fielding the system as is the system production schedule. The recently published Army Force Modernization Master Plan[1] is replete with facility problems raised by the Army major commanders as impediments to planned new system distribution schedules and unit relocations and reorganizations. In January 1983 the Commander in Chief, USAREUR, stated that "there now appears to be no alternative to reexamining earlier decisions regarding the timing and sequencing of modernization initiatives."[2] The Army is experiencing some difficulties in managing its massive force modernization program with respect to its facility needs.

PURPOSE

The purpose of this study is to examine the relationships between the Army systems acquisition and facility construction processes, to understand how those processes are coordinated and to determine if changes can be made to improve the interactions between them so that the facilities will be there when the systems are fielded.

The authors' interest in this area stems from one author's recent experiences in USAREUR with facility planning and construction. When the M-1

tank and the UH-60 helicopter arrived in Europe there were some minor facility problems which had not been anticipated. Two examples: The UH-60 requires a different voltage power source for test equipment than does the UH-1 helicopter. Therefore, electrical power supply in maintenance facilities had to be modified on short notice.[3] The M-1 tank cannot fit in existing tank wash racks with its side skirts in the raised position. Again, expedited construction was needed.

Planning for the location of and the facility needs of the Patriot air defense missile units and the Multiple Launch Rocket System (MLRS) artillery units and the programming, budgeting and constructions of those facilities required extraordinary management activities to meet desired fielding schedules.[4] It would seem that better coordination earlier in the development of the systems would have reduced these problems and permitted the orderly commitment of construction funds rather than the adjustment of priorities and reallocation of funds and effort which actually occurred.

HYPOTHESIS

The hypothesis under which this study was conducted is that the basic process is in place to anticipate, fund and construct the new facilities which will be required to support new systems when they are fielded. However, since several recently fielded new systems required facilities which had not been anticipated, there may well be some coordination actions which are not receiving enough emphasis or which have fallen into disuse.

PROBLEM

The research effort attempted to answer the following questions:

a. Are facility requirements being anticipated and adequately scoped during research and development so that meaningful facility programming guidance can be issued prior to production and deployment?

b. Does the planning, programming and budgeting cycle for Military Construction Army (MCA), Operations and Maintenance Army (OMA), and family Housing Management (FHMA) mesh with the process for production and fielding of new systems so that the facilities can be funded and constructed when the systems are fielded?

STUDY APPROACH

The answers to these questions were sought through the use of two parallel approaches. First, extensive interviews were conducted with members of the Office of the Secretary of Defense (OSD), the Army Staff, United States Army Europe (USAREUR), the U.S. Army Materiel Development and Readiness Command (DARCOM), the U.S. Army Corps of Engineers (USACE), the Defense Systems Management College (DSMC) and the staff of the U.S. Congress. Through these interviews and the study of pertinent regulations, plans, reports, letters and other documents, an attempt was made to understand how the systems are intended to function and when and how systems acquisition and facilities construction interact, as well as those areas which were perceived to not be working well or in which improvements could be made.

The second part of the study approach was to examine the activities of selected project managers in the area of facility requirements. Visits were made to the project manager offices for the M-9 armored combat earthmover, the UH-60 helicopter, the PATRIOT air defense missile system and

the MLRS artillery system. Followup interviews were then conducted with members of the Army staff, DARCOM and USACE to clarify understanding of how the Army plans to manage facilities construction for new systems. See Appendix A for summaries of all interviews.

STUDY FOCUS

This study was not intended to be a detailed analysis of either the Army systems acquisition process and its management structure or the Army facilities construction process. Rather the focus of this study is on the links between them. A radical restructuring of Army commands or management systems was not considered. The study concentrated on ways to make the existing processes work better.

FOOTNOTES (PAGES 1-5)

CHAPTER I

[1]Department of the Army, Army Force Modernization Master Plan, HQDA, November 1982.

[2]Department of the Army, USAREUR FY 1985-FY 89 PARR, HQ USAREUR, 6 January 1983, p. 3.

[3]HQ USAREUR (ACAGC-AN), Message "Commercial Electrical Power Requirements in USAREUR for Aircraft TDME," 0908557, Sept 81.

[4]Interview with Mr. Gardner, MLRS PMO, 25 January 1983 and MAJ Millar, PATRIOT PMO, 26 January 1983.

CHAPTER II

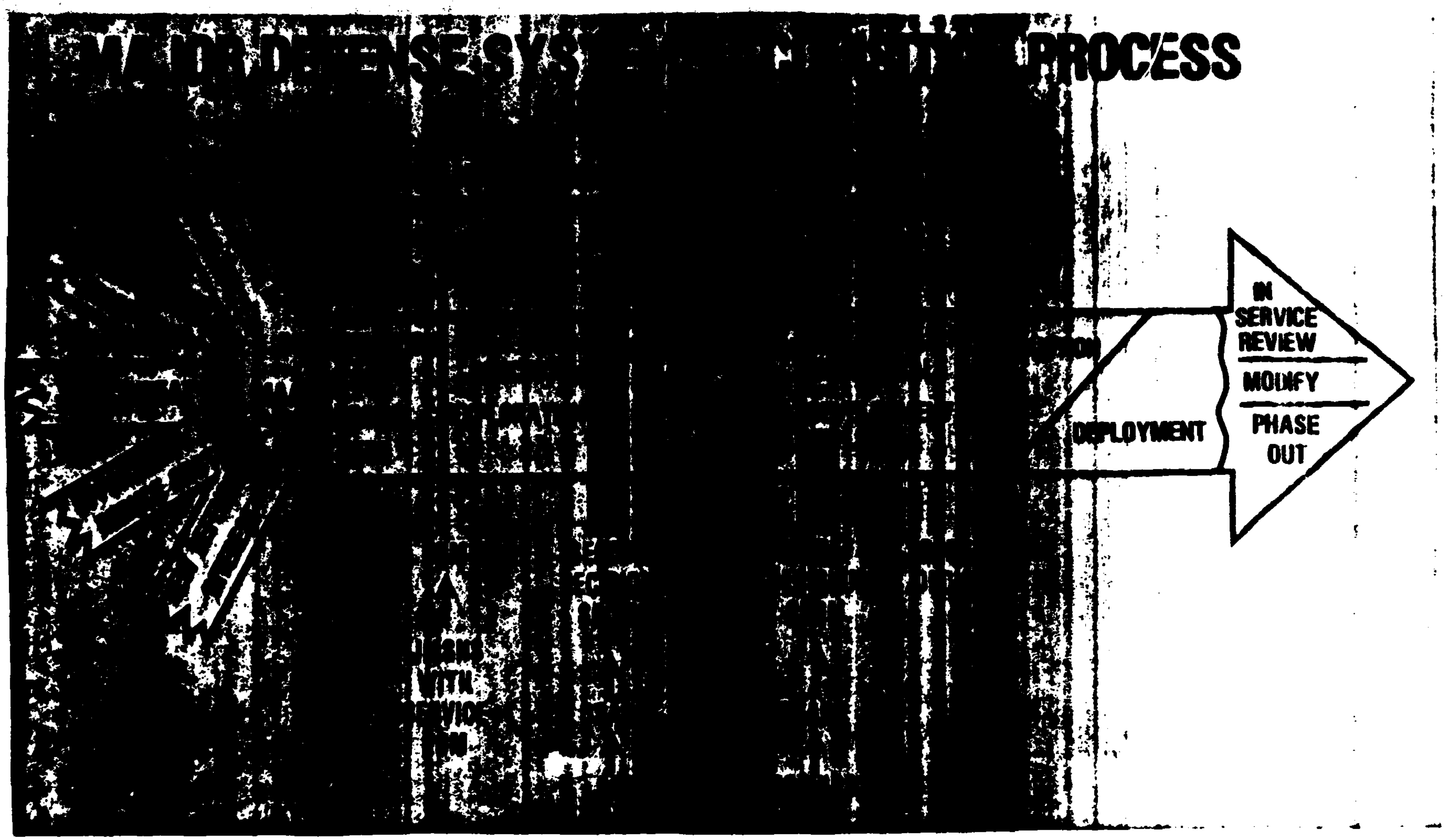
SYSTEMIC INFLUENCES ON FACILITY REQUIREMENTS FOR MODERNIZATION

GENERAL

As is so with every other process in the Army, facility construction does not exist in a vacuum. Many factors such as other internal processes, the NATO environment, Congressional perspectives, and even the mindset of Army planners and leaders have a bearing on the development and satisfaction of facility requirements.

SYSTEMS ACQUISITION PROCESS[1]

The systems acquisition process starts with concept exploration, proceeds through a demonstration and validation phase to full scale development and culminates with production and deployment of a new system. This process for major systems is described in Department of Defense (DOD) Directives 5000.1 and 5000.39 and DOD Instruction 5000.2. The process for non-major systems is essentially the same with lower levels of approval and review authority generally based on dollar thresholds. It is important to understand that the decision to proceed from one phase to the next is event driven and not driven by specific dates. For example, if problems occur in applying new technology during the demonstration and validation phase, a decision to proceed to full scale development can be deferred until the difficulties are worked out. The process is graphically protrayed at Figure 1.

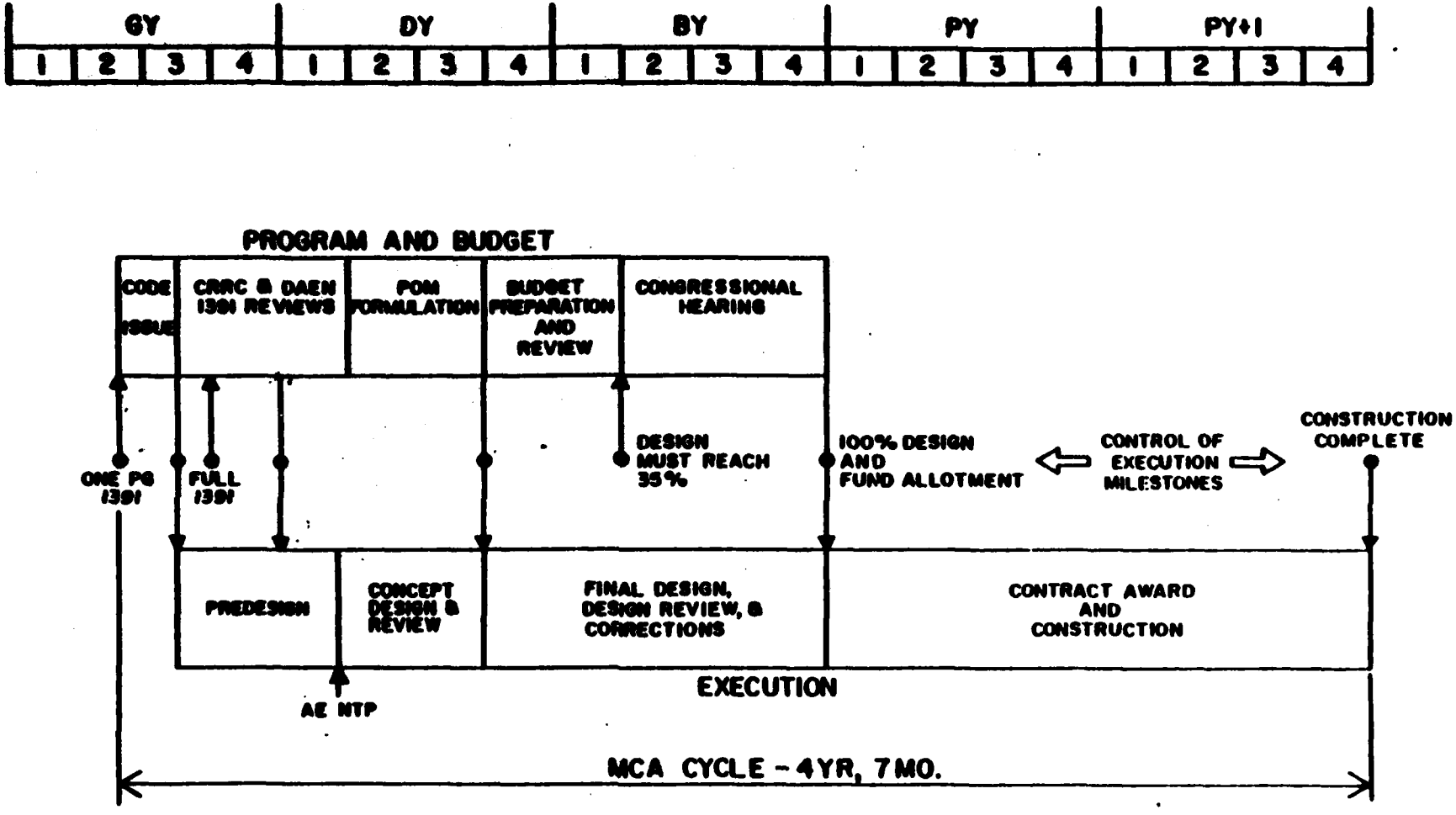

PROCESS
IN SERVICE REVIEW
MODIFY
PHASE OUT
DEPLOYMENT

MILITARY CONSTRUCTION PROCESS

The MCA program development and execution process is the means by which facilities essential for Army missions are acquired. The MCA process tends to take on a 5 year look after the formal facility requirements have been established. The parts of the process are shown in Figure 2.[2] Details of the process are described in Appendix B. The execution of the process is complex. Efficient management is frustrated by congressional restrictions and controls (brought about by acknowledged management deficiencies in the past) and the desire by field users to get facilities more quickly. A general analysis of the current status of the MILCON program and management reveals that the construction workload (planning, programming as well as execution) is expanding considerably and the efforts by agencies at all phases of program effort--particularly the USACE and MACOM DEH elements--are hampered because there has been little commensurate increase in qualified staff manpower. Customary program and budget turbulence is aggravated by the added workload, particularly for Quality of life (QOL) and modernization efforts. The European environment is extremely complex forcing additional burdens on the structure. See Appendix C. Coordinating the time dependent MCA process with an event dependent acquisition process exacerbates an already difficult problem. Extensive DA and USACE efforts are underway to modify the MCA process.[3] Although it is agreed that some shortening of the schedule can be obtained, the reductions will neither be dramatic nor easily agreed to by the Congress.

PPBS CYCLE

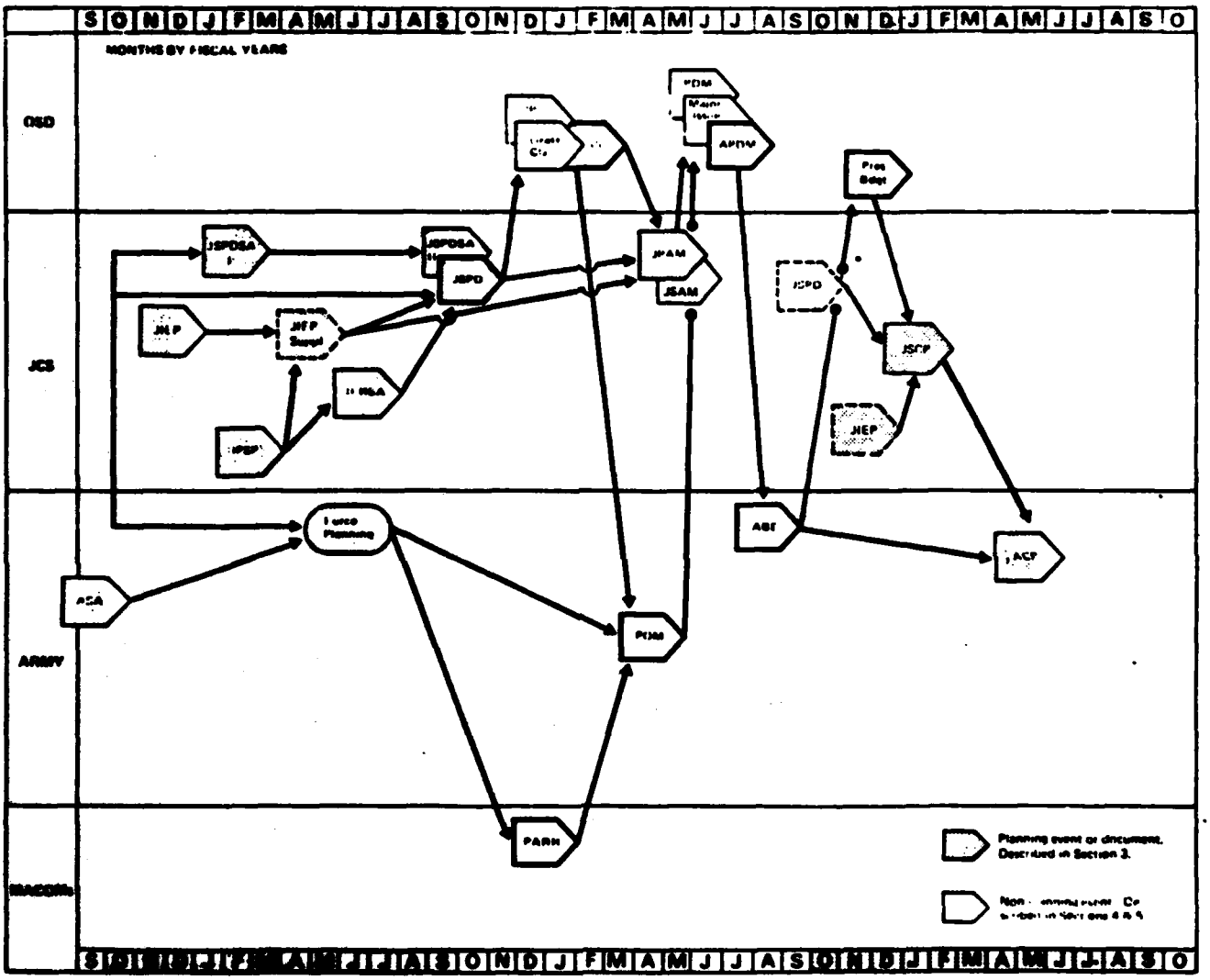
The PPBS cycle is graphically shown in figures 3 through 5. The critical points of review and decision are prescribed to effect a resolution of



NOTE: THE EXECUTION PROCESS NOT TIME SCALED

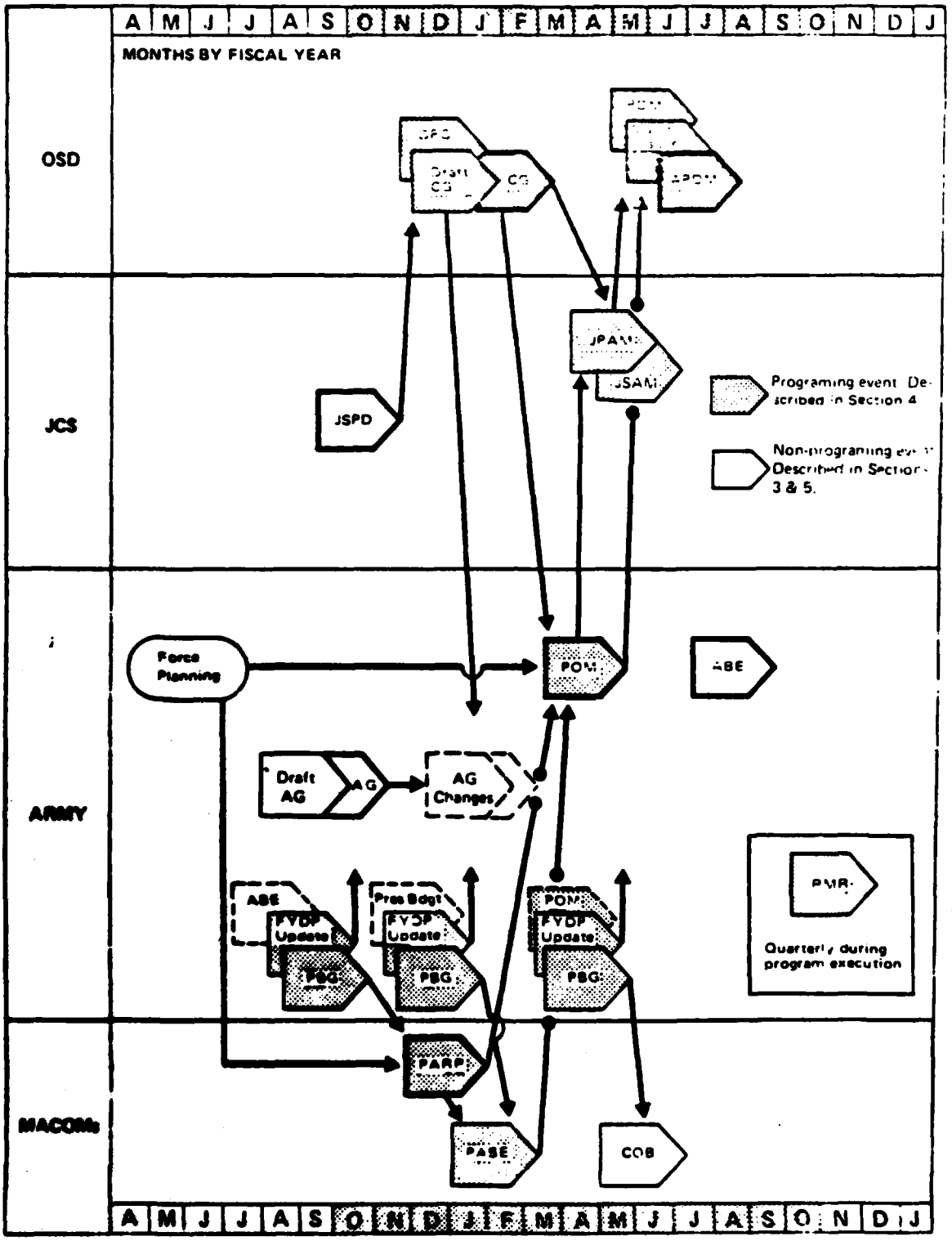
Figure 2

THE PROGRAM AND BUDGET AND EXECUTION PROCESSES OF THE MCA



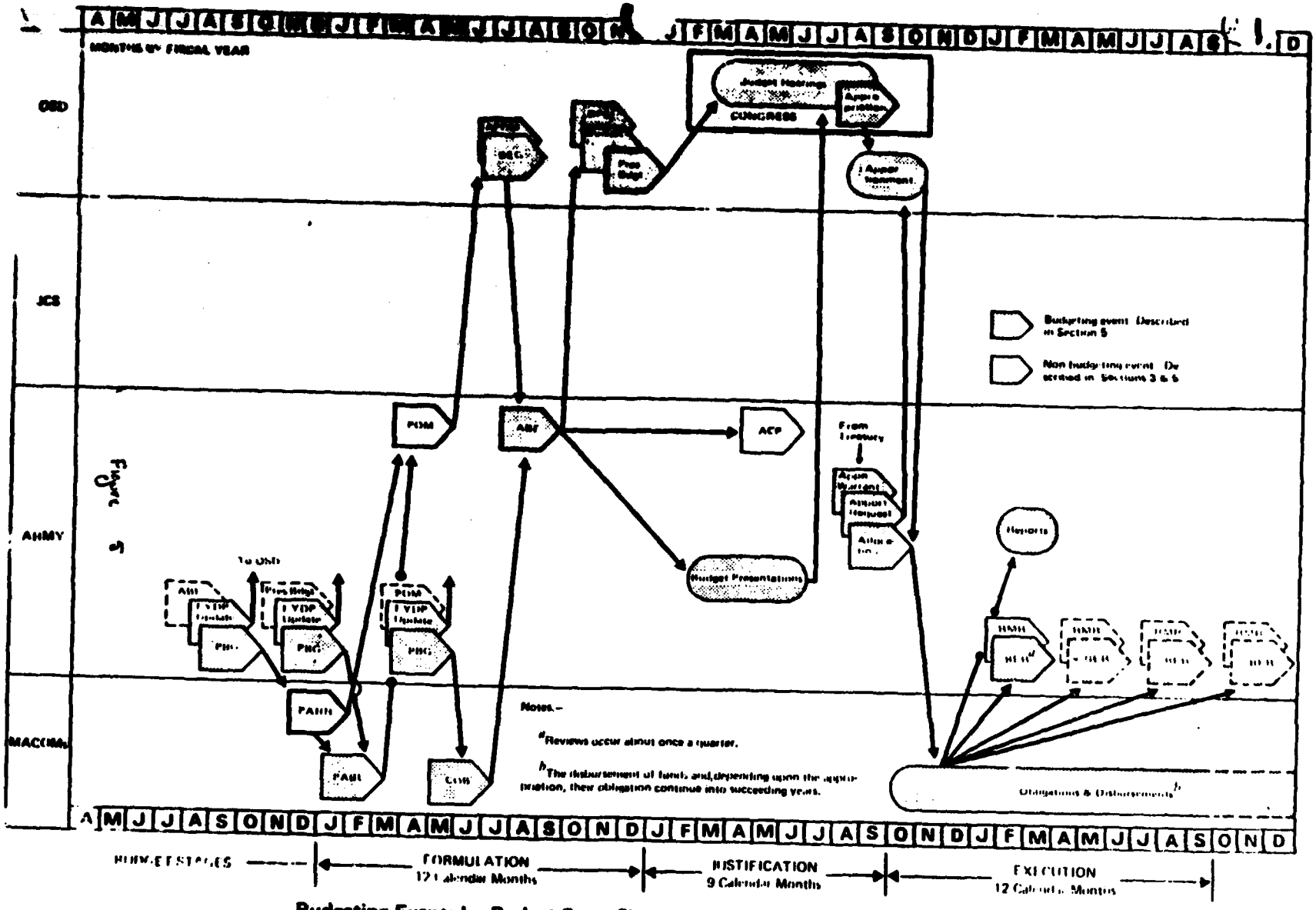
Planning Events or Documents Showing Principal Interrelationships — Army PPBS Cycle

Figure 3



Programing Events Showing Principal Interrelationships – Army PPBS Cycle

Figure 4



Budgeting Events by Budget Stage Showing Principal Interrelationships — Army PPBS Cycle

resource allocation, whether in program or budget years, along time lines backward planned from the annual submission of the President's Budget to the Congress. The matching of the contents of this documentation to the needs of the Army in modernization and facilities is critical. As perceived from a study of the figures, the major commands (MACOMS) are presented with the awkward task of reconciling larger demands on resources than is available in "timing windows" which might or might not meet the same schedules of the systems under development and/or deployment and the facility planning and construction process.

ORGANIZATIONS

Virtually every element of the Army Staff and most MACOMS are involved in some way in the development and fielding of new systems. This process is extremely complex and requires continuous, repetitive coordination at all levels to keep various elements synchronized. Just the part of the process concerned with facility requirements and construction has tentacles throughout the Army. A graphical presentation of an ideal interaction is shown in Figure 6.[4] However, the three primary actors concerned with facilities are the project manager who is developing a system, the major commander who will be the user of a system and the Chief of Engineers who will be the constructor of the facilities for the system.

The project manager starts the process during the concept exploration phase. DOD Directive 5000.39 prescribes policy and responsibilities for Integrated Logistic Support (ILS) for systems and equipment.[5] The directive defines ILS as a disciplined approach to the activities necessary to: (a)

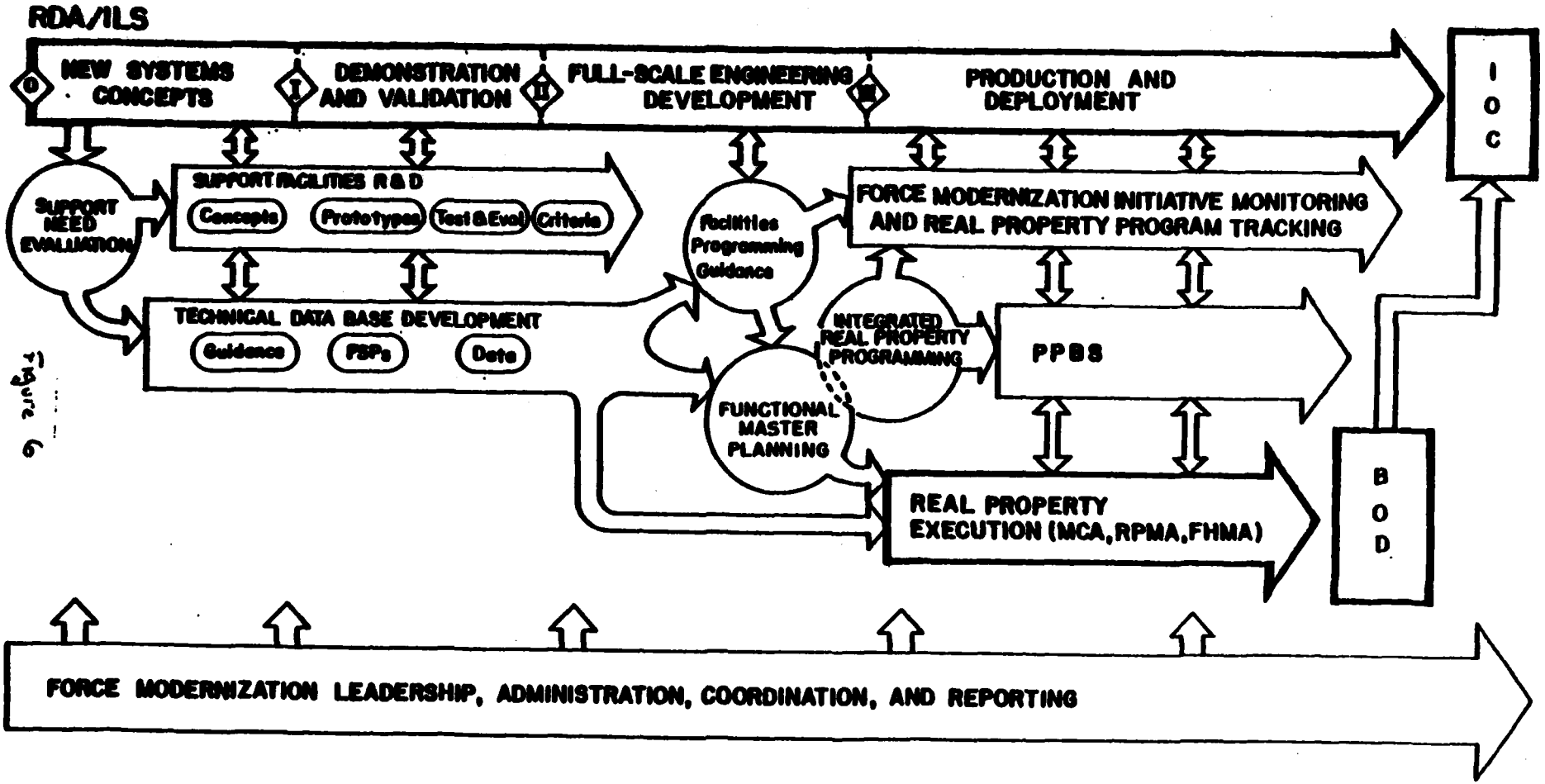

RDA/ILS
0 NEW SYSTEMS CONCEPTS
I DEMONSTRATION AND VALIDATION
II FULL-SCALE ENGINEERING DEVELOPMENT
III PRODUCTION AND DEPLOYMENT
IOC
SUPPORT NEED EVALUATION
SUPPORT FACILITIES R&D
Concepts
Prototypes
Test & Eval
Criteria
TECHNICAL DATA BASE DEVELOPMENT
Guidance
PSPs
Data
Facilities Programming Guidance
FORCE MODERNIZATION INITIATIVE MONITORING AND REAL PROPERTY PROGRAM TRACKING
INTEGRATED REAL PROPERTY PROGRAMMING
PPBS
FUNCTIONAL MASTER PLANNING
REAL PROPERTY EXECUTION (MCA, RPMA, FHMA)
BOD
FORCE MODERNIZATION LEADERSHIP, ADMINISTRATION, COORDINATION, AND REPORTING

Figure 6

cause support considerations to be integrated into system and equipment design, (b) develop support requirements that are consistently related to design and to each other, (c) acquire the required support, and (d) providing the required support during the operational phase at minimum cost. The directive defines the ILS element of facilities as the permanent or semi-permanent real property assets required to support the materiel system, including conducting studies to define types of facilities or facility improvements, locations, space needs, environmental requirements, and equipment.

It is intended that this early ILS planning will affect the design of a system by considering system operational concepts, readiness and affordability constraints, alternative strategies, design options, reliability and maintainability characteristics, and documented logistics support analyses to link design and ILS requirements to readiness threshholds, and to define detailed support element requirements. By the end of the concept exploration phase at Milestone I, the project manager should have determined preliminary facility requirements and insured that using MACOMS have programmed them for construction.[6] By the end of the demonstration and validation phase at Milestone II, facilities design should be under way on a schedule to be ready for construction contract award in the year construction funds will be appropriated.[7] At the end of the full scale development phase at Milestone III when the service makes the decision to go to production and deployment, facilities construction should be on a schedule to be completed in time to support the deployment.[8]

Throughout this process the project manager must provide information to

several other agencies and get information from them in order to keep facility requirements coordinated with system development. From the outset he must be in contact with the Army Training and Doctrine Command (TRADOC) System Manager (TSM)[9] for his system to insure that the system being developed properly meets the stated doctrine derived need. Conduct of tests at various phases, including facilities for those tests, must be arranged. Continuing throughout the acquisition cycle is the increasingly more precise definition of the training establishment to support the system including training facilities, e.g., simulators.

At the same time the project manager must be communicating facility requirements to the MACOMs who will be the ultimate users of his system, e.g., USAREUR, so that those commands can initiate the military construction process through the PPBS to have the facilities ready when the system is deployed. The Army major commander must program and justify the need for his facility requirements in competition with other MACOMs and all other Army needs for resources. The major commander's problem is further complicated by the event dependent nature of the acquisition process as opposed to the time dependent nature of the MCA process as it is tied to the PPBS.

In recognition of the complexity and magnitude of the facility requirements to support the Army force modernization program, the Chief of Engineers initiated three actions to provide dedicated support to coordinating this effort. (see Figure 7)[10] A Force Modernization Group was established in the Military Programs Directorate of USACE to manage and execute the Corps of Engineers force modernization technical base support mission by the identification and documentation of facility support impacts and needs early

USACE FORCE MODERNIZATION FACILITIES SUPPORT
ORGANIZATIONAL RELATIONSHIPS & RESPONSIBILITIES

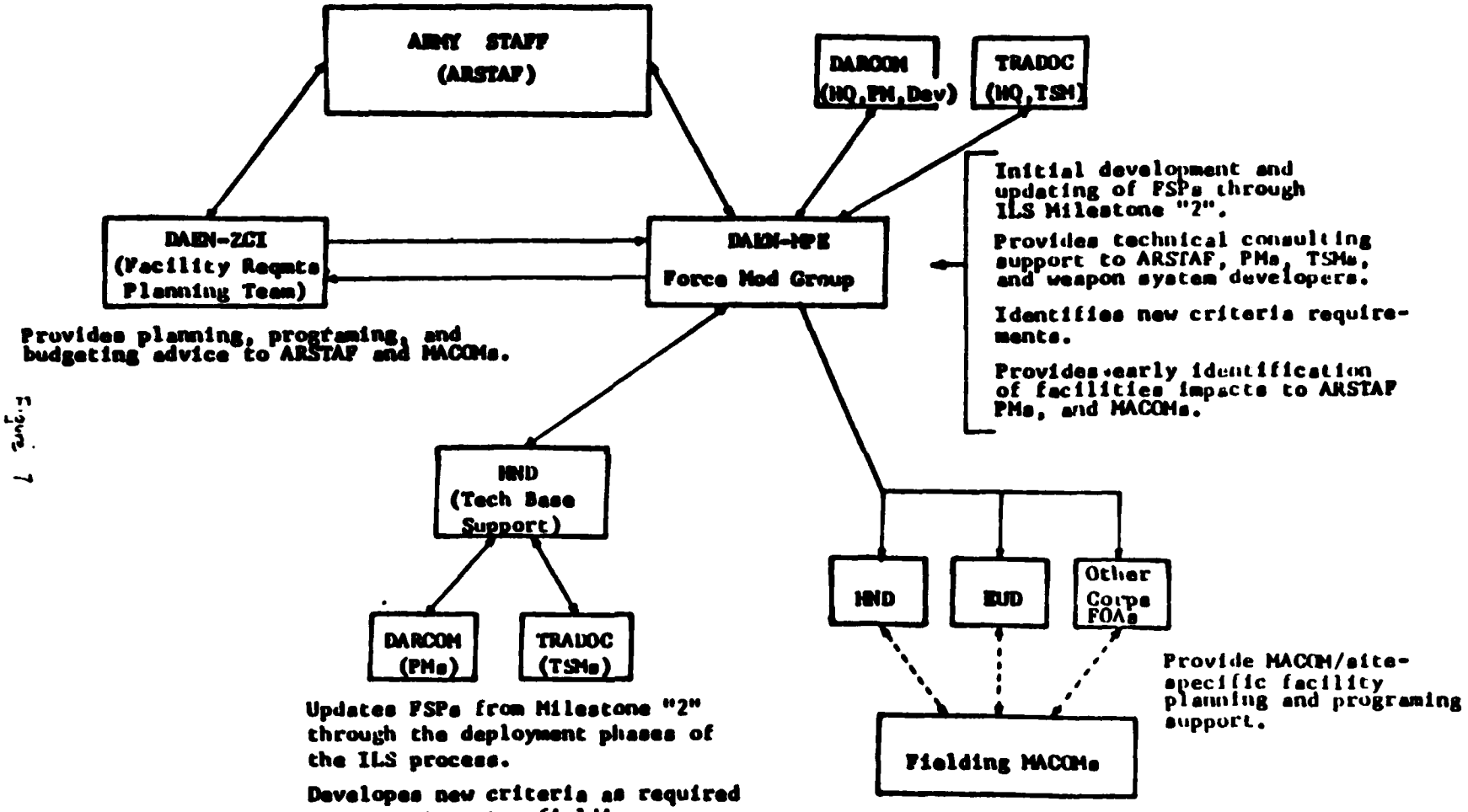


Figure 7

in the system development process. This group is also responsible for identifying new facility criteria and standards needed for programming, design and construction. The sole purpose of this group is to aid project managers, MACOMs and the Army staff in recognizing, planning and programming for facility requirements.

The vehicle developed to provide this aid is the Facility Support Plan (FSP). The FSP is intended to be used as a general informational planning guidance document. The user must compare the facility requirements identified in the FSP with existing facilities, facility inventories and stationing plans to determine what existing facilities should be modified or what additional facilities should be programmed at a specific installation.

A Facility Requirements Planning Team has been established in the Office of the Assistant Chief of Engineers to provide planning, programming and budgeting advice to the Army staff and MACOMS. This team is fully involved in the Army staff PPBS activities to insure that military construction is integrated with system fielding.

The U.S. Army Engineer Division, Huntsville, has been designated as the primary USACE field agency to provide technical base support by assisting project managers to develop basic requirements and criteria, by assisting the USACE Force Modernization Group in preparing and updating FSPs from concept exploration through Milestone II and assisting the project manager and the TRADOC System Manager in updating the FSPs from Milestone II through deployment.

The Army Force Modernization Coordination Office (AFMCO) was established

as the umbrella Army staff agency to provide the glue to hold the whole effort together. This office has several vehicles for monitoring status of programs, informing the staff and field of program status and schedules and resolving conflicts.

The Modernization Resource Information System (MRIS) is an automated system which collects data on the status of programs using data from other reporting systems and specific field reports.

The Army Modernization Information Memorandum (AMIM) puts together in one document, albeit composed of five volumes, descriptions of new systems, expected progress schedules of development , e.g., Milestones II & III, production schedules, planned deployment schedules and unit reorganization schedules. The AMIM tells the major commander when to expect to have it and hence when facilities must be ready, and consequently the engineer what and when he must construct.

All of these schedules do not always mesh completely. Often there are changes in schedules for a variety of reasons (budget, technology problems, negotiations with host countries) which will require adjustments to schedules and funding. The Army Force Modernization Master Plan (AFMMP) is a dynamic plan which describes the transition plan to the Army 90 organization, fielding schedules for new equipment, equipment distribution and redistribution plans, stationing plans and priorities. The AFMMP is a living document which evolves by an iterative process. AFMCO publishes the plan and then receives feedback from the MACOMs concerning problem areas. Then the Army staff works with the MACOMs to resolve problems by schedule changes or funding changes. An updated

plan is then published and the process starts again. Highlighted in several places in the AFMMP are facilities problems.

CONGRESSIONAL PERSPECTIVES

The Congress has less than complete confidence in the thoroughness of Army planning to support requests for construction appropriations and in the degree to which construction needs are considered when making major capital investment decisions for new systems. There is a perception that the military construction account is the account used to balance the budget when there aren't enough funds to do everything that is desired. Consequently the Congress frequently feels that it must place very specific bounds or limits on the use of construction funds and at times has denied appropriations because of insufficient justification.

SUMMARY

Although facility requirements are a relatively small part of the total life cycle costs of most systems, the timely construction of needed facilities is an absolute prerequisite to deploying many systems. There are many factors which influence the systems and most of those factors interact with one another. Although providing facilities is a small part of the system acquisition process, it is extremely complex.

FOOTNOTES (PAGES 7-21)

CHAPTER II

[1]DOD Directive 5000.1, Major System Acquisitions, March 1982.

[2]DA, MCS Cycle Study: Ways to Shorten the MCS Cycle, CERL, September 1981, p. 2-2.

[3]DA, MCA Cycle Study Vol. I, CERL, September 1981, p. 15.

[4]Ibid., p. 14.

[5]DOD Directive 5000.39, to be published, will superceed-the 17 January 1980 edition, p. 1.

[6]Ibid., p. 12

[7]Ibid., p. 13

[8]Ibid., p. 19

[9]Interview, LTC Ames, HQ TRADOC, 29 November 1982.

[10]COE letter, "Facility Requirements for New Army Systems," 23 November 1979.

CHAPTER III

FACILITY REQUIREMENTS-SYSTEMS ACQUISITION INTEGRATION-A PERFECT WORLD POSSIBLE

ELEMENTS

The problem statment presupposes that a perfect management world could exist which would have an effective integration of facility requirements into Army systems acquistion and deployment efforts. This perfect world of necessity means that:

a. systems are developed and deployed incorporating facility requirements into planning efforts within perscribed management procedures,

b. effective interfaces exist and are routinely exercised among the users, systems acquisition, construction planning and execution and resource management communities which insure that the required facilities are available,

c. the management processes which govern the environments for these functions are synchronized,

d. total life cycle costs can be developed,

e. funds for system acquisition and deployment are not constrained, and

f. detailed management information is developed and provided to decision/review authorities for execution of responsibilities without uncertainty in knowledge of program status, total life cycle costs and schedules.

PROCESS SYNCHRONIZATION

To determine if such a perfect world is even possible it is necessary

first to determine if the factors can be ideally meshed to represent the ideal notion described above. The system acquisition and construction processes might ideally be integrated as noted in Figure 6. p.15. The PPBS cycle might also generally overlay on the other two "processes." The result leads to a conclusion that the management processes can be effectively synchronized and forcibly implemented. It is possible to even compress some portions of the time factors associated with the systems acquisition system (e.g., dramatically constraining the time for system development through the full scale development phase may still be possible and not adversely impact facilities availability on deployment. The MLRS development program was constrained in this manner: 60 months to initial fielding without serious impact on the programmed construction and facilities availability [accomplished with extraordinary management effort]).[1] Therefore, within reasonable bounds, the synchronization of the various processes seems possible.

FACILITY REQUIREMENTS

It is possible to maintain a check on the system development at every decision point (whether exercised by the project manager (PM) and his staff, augmented if necessary, or at senior echelons of authority) and perform detailed facility requirements definitions starting with the concept exploration phases of systems acquisition. The ILS as prescribed by DOD Directive 5000.39 or guidance as implemented by AR 700-124, establishes the methodology and mechanisms for guaranteeing at least the potential for incorporating facility requirements planning into systems development and deployment.

ORGANIZATIONAL INTERFACES

As above, the potential exists for routinely exercising an established organizational structure responsible for implementing this role, the system acquisition, construction and resource management functions. After analysis, it is concluded that such organizational elements do exist which might permit effective integrated total program execution.

LIFE CYCLE COSTS

Establishment of the program cost baseline and total life cycle costs for a system(s) integrated into the Army force structure would seem possible. Totally accurate costs may not be possible at MS I but the estimates become more accurate as the development and facility requirement definition progress. The potential for divergence from the "perfect world" is probably highest in consideration of this factor. As noted in Table 1, a notional system's life cycle costs and funding can be viewed from different perspectives. There is therefore some likelyhood that total systems costs can be lost even if the costs identified by the PM for specific items (e.g., RDTE, procurement) can be totally accurate. The PM's funding does not include MCA allocation but yet the life cycle cost does include this factor.

MANAGEMENT INFORMATION

Assuming all the above exists and meets our "perfect world" criteria, management information must also be available. There is overall program integration information, which is needed by decision makers to meet their responsibilities for overall Army program execution. This can be easily visualised in an unconstrained funding situation. In a constrained environment, this detail and timeliness of management information is more

NOTIONAL COSTS/FUNDING
(5 YEAR WINDOW)

BCE COST ("PRICE")			PBS FUNDING			FUNCTIONAL PDIP FUNDING			FM'S FUNDING		
RDTE		5	RDTE		5	RDTE		5	RDTE		5
INVESTMENT			PROCUREMENT			PROCUREMENT			PROCUREMENT		
- Non-recurring	5		- WTCV	25		- WTCV	25		- WTCV	25	
- Production	33		- AMMO	5		- AMMO	5		- AMMO	5	
- Eng Chgs	5		- OPA 1	4		- OPA 1	0		- OPA 1	0	
- Sys Mgt	2		- OPA 2	4		- OPA 2	0		- OPA 2	0	
- Init Spares & Repair Parts	5		- OPA 3	2		- OPA 3	0		- OPA 3	0	
- Other	5				40			30			30
- Operational/ Site Act	5	60	MCA		5	MCA		5	MCA		0
OPERATING AND SUPPORT			OMA		15	OMA		5	OMA		0
- Speres, POL, Unit Training	10										
- Depot Maint	4										
- Mods, Materiel	2										
- Other Direct Support Opns	2										
- Ind Spt Opns	2										
- Mil Personnel	15	35	MPA		15	MPA		15	MPA		0
TOTAL		100			80			60			35

Table 1

critical. After review of the management information that is provided, in general, it is concluded that the basic mechanisms do exist to meet the general issues. The Army PPBS has all the mechanisms established to provide the data in reasonable form and depth for generally effective decision making whether reviewed in an unconstrained or constrained funding environment. Management information systems for facility requirements planning and construction have been established for years. However, the interface documentation between any new system PM and the Engineer community is only now being developed in the necessary detail. Documentation and management mechanisms for systems acquisition have been and continue to be in existence. Special management information systems to integrate facility requirements and system acquisition data and schedules at MACOM and DA levels are developed to a sufficient degree to meet minimum essential needs and are gradually improving in effectiveness. The Force Modernization Reporting System (AR 700-10), the Army Modernization Information Memorandum (AMIM), the Modernization Reporting Information System (MRIS) and the Force Modernization Master Plan are the best examples.

SUMMARY

There is, then, the potential for the perfect world to exist providing that all the assumptions stated above do come to pass. As one would expect, that perfect world never quite occurs. The roadblocks to perfection are addressed in the next chapter.

FOOTNOTES (PAGES 23-27)

CHAPTER III

[1]Interview with Mr. D. Gardner, MLRS PMO, 25 September 1983.

CHAPTER IV

FACILITY REQUIREMENTS-SYSTEMS ACQUISITION INTEGRATION-A NON PERFECT REALITY

REALITY

It is obvious that the reality of facility requirements integration with the Army systems acquisition process is quite different from that of the ideal world.

INADEQUATE ILS DEFINITION

The Integrated Logistics System as evolving in the Army is not meeting the intent of the ideal facility requirement process. Logistics support plans for major systems devote relatively insignificant effort to facility needs early in programs and in some cases facility issues are identified quite late in an effort.

The LSP for PATRIOT devoted 1/3 of a page to the Facilities Plan.[1] The eventual facilities costs were not less than $45M in FY 82 and are $48M in FY 83 (10 sites, 8 in USAREUR).[2] It is noteworthy that while generally ignoring the issue initially, the construction community, in coordination with the PM has recuperated through some extraordinary management efforts. It is even more interesting to note that this was accomplished in a construction funding environment which involved multiple funding sources to include MCA and NATO Infrastructure funds.

The MLRS Fielding Plan, and associated data for MLRS (MRIS, etc.) provided insufficient information to USAREUR Engineers to readily prepare MCA justification (Form 1391) for deployed MLRS related facilities in Europe.[3]

The ammunition storage facilities issue remains a problem. MLRS budgets for MCA are $16.8M (11 projects, 6 in Europe) in FY 82 $38.55M (18 projects, 13 in Europe) in FY 83 and $61.5M in FY 84 (17 projects, 10 in Europe).[4] Again extraordinary Engineer efforts have been instrumental in insuring reasonable beneficial occupancy dates (BOD) for appropriate facilities. MLRS had a shortened development cycle and drastically needed excellent, early facility requirements definition.

Histories of the development of other systems within the current Army modernization program reflect similar basis for concern on the validity for potential of a "perfect world" in this respect.

The extraordinary efforts required have stretched credibility in our long range planning capabilities in this regard.

With only these few instances as examples, it is obvious that part of the ideal world does not exist. Based on this and many more instances, it is apparent that intense efforts may be required to bring the systems acquisition efforts into line with more efficient management requirements.

LACK OF PM AWARENESS

PM's are not totally aware of available Engineer capabilities. The office of the Chief of Engineers is developing Facilities Support Plans for systems which will effectively support project development from a facility requirements perspective. The OCE had initially started this effort as a self protection measure for Engineers, to preclude the schedule for construction from becoming so much out of synchronization with system(s) deployments that it would have a grossly adversely impact on material fielding. As early as November 1979 the Chief of Engineers informed the VCSA of his intent to

initiate this management effort. The trials of the MACOMs, particularly USAREUR, are detailed above. Material Fielding Plans are being completed too late to highlight anything but critical quickly fixed, small facility issues during fielding.

LIFE CYCLE COST DEFICIENCIES

Total life cycle costs have not always included reasonable, if any, facilities costs in early system development. For example, full DIVAD deployment will have a requirement for at least $260M MCA when the system is fully fielded. As currently projected and as late as the Baseline Cost Estimate (BCE) definition, these costs were identified at only a $150M level.[5] This was obtained only after significant out of cycle coordination with USAREUR. It is apparent that the increase in costs is not the result of merely improved project definition. Interactive facilities definition was required in Europe before reasonable facilities projects could be scoped. Guidance was relatively inadequate. Common sense says that in this situation there is a solution to the problem--iterative identification of the stationing plan and from that the explicit facility requirements. The point is, however, that an earlier development of detailed criteria by the PM would have precluded delay and extraordinary management efforts by Engineers and resource managers as well as the PM.

MANAGEMENT INFORMATION SYSTEM DEFICIENCIES

Facility Support Plans and detailed entries in the AMIM, MRIS and Force Modernization Master Plan do not exist for all efforts under Army 90, much less unique systems under the Army systems modernization effort. Those segments of the overall management information systems involved in the facility requirements interfaces with systems acquisition and deployment are

evolving in sophistication and detail. However, the basic data entries, those provided initially by the PM at MS 0 and MS I, have not been forthcoming.

IDEAL WORLD ATTAINABLE OR WORTH THE EFFORT?

Concluding that the ideal world does not now exist begs the issues: (1) Is the ideal world attainable?; and (2) Is the necessary effort for best efficiency worth it?

This study confirms that systems can be developed and deployed incorporating facility requirements with a reasonable level of effort on the part of PM's and supporting Engineers. It further confirms that this is not now being accomplished in an ideal manner.

a. Systems are not developed and deployed incorporating facility requirements into planning efforts completely within prescribed management procedures. The effort required to follow the prescribed management procedures is expected to be small.

b. Effective interfaces exist, but are not routinely used by the systems acquisition, construction planning and execution, and resource management communities to insure that the required facilities are available when needed. The MACOM Engineers depend on this for the effective execution of their role in system fielding. More efficient interaction among the PM, Engineers (or a facilities expert in the PM office) and the MACOMs would be a welcome and relatively low cost efficiency. From this early interaction comes an identification of the facilities issue as part of the total system development. Whether viewed from an analytical review of the processes or concluded from actual analysis of specific acquisitions (both of which were

done in this study), it is apparent that resources expended in the early stages of system acquisition save significant time and effort later.

Funding must be provided either to the PM (and then to an Engineer element such as a Division or District of USACE) or directly to USACE to be expended in coordination with the PM. The level of funding is not expected to be high and will vary as the Army Force Modernization Program progresses. The present USACE organization is equipped to use such funds to support the requirements of PMs and MACOMs.

The Army's program to modernize in the 1980's has resulted in the creation of large and widely distributed force modernization staff elements. Elements exist down to Division level and large staffs are at the MACOMs. The Army Force Modernization Coordination Office (AFMCO) at DA represents the capstone element. These staff elements are intended to be the focus for information about and coordination of the modernization program. It is clear that at the lowest level our information system fails to provide the requisite details in a timely manner to the functional elements (Engineers, resource management, plans and operations, logistics, ultimate users). With the improvement of the MIS, it would seem that the force modernization element at the lowest level will no longer be necessary. A cleaner, more efficient process would be to work through the Division G-3 and supporting Engineers and distribute the present force modernization staff to the local functional elements.

c. The management processes which govern the environment for the PMs, Engineers, resource managers and users are not fully synchronized. It is perceived that forced synchronization would be inefficient and counter

productive. These management processes are too fluid individually and in relation to each other to enable an efficient synchronization. The windows of opportunity for integrating the PBBS cycle, the system development, testing and fielding to units and the construction process move in a very dynamic fashion with respect to each other. Attempting to force synchronization would be difficult, would require a great deal of management effort and be expensive.

d. Completely accurate life cycle costs cannot be developed at the earliest phases of the systems acquisition process. Of course, the earlier accurate costs, especially for facilities, can be developed, the better. It is possible to estimate the basic facility requirements at the MS 0 and MS I decision points by extrapolating from the system to be replaced or from other similar systems. As a new system's configuration and planned employment becomes better defined, the facility requirements and costs estimates can be refined and made more accurate.

e. Unconstrained funding for any but the most critical system development and fielding will not be provided by either DOD or an economy minded Congress.

f. Detailed management information is not now fully developed and provided to decision authorities so that they can execute their responsibilities with full knowledge of program status, schedules and life cycle costs. Improvement of management information systems is clearly possible. Data collection, analysis and information displays are available for use by decision authorities, but the decisions must be made in the face of unnecessary uncertainties.

The collection, analysis and distribution of data using ADP will continue to receive intense management effort. The information systems now in existance only need to be fully developed and used. The reports required to support ILS, FMMRS and other aspects of systems acquisition can provide needed information and analysis. The PBBS can provide the resource managment information. The AMIM and the FMMP have been initiated and will continue to improve and provide needed information. As these various sources of information improve and become integrated there is a real potential for reducing the uncertainties for decision makers with consequent improvements in efficiency.

SUMMARY

As one might have expected when it was decided to investigate the issues of attainability and worth of effort, the answer is mixed and action is appropriate in only certain areas.

FOOTNOTES (PAGES 29-35)

CHAPTER IV

[1]DA Materiel Field Plan, USA TRADOC Fielding Plan for PATRIOT (Draft), PMMIS PMD, May 82.

[2]Data obtained from Office ACE, 14 February 1983.

[3]Information obtained from ODCSENGR, HQ USAREUR, June 1981.

[4]Data obtained from Office, ACE, 14 February 1983.

[5]Ibid.

CHAPTER V

ISSUES/JUDGEMENTS

In the course of developing the conclusions several issues have evolved.

ENVIRONMENTAL ELEMENTS OF SIGNIFICANCE:

The Army "Weapons System"

The Army "weapons system" is the basic fighting unit, not a unique piece of equipment. It appears that the Army has always found it difficult to defend its new equipment because invariably, the combat power value gained for the modernization is to be totally understood only in the context of its contribution to basic company or battalion sized elements. The closer the new equipment comes to the size and cost of an aircraft, a tank or missile system, the more easily appreciated that modernization and its acceptance by OSD and Congress. The facility requirements develop accordingly. The view of the basic Army weapons system- a combat unit- and its modernization has a decided effect internally and externally on how facility requirements and funding are addressed. The facility requirements issue must be viewed in this context.

Systems All Different

The new systems (equipment) being acquired under the current Army modernization program represent a broad spectrum of functions and reach into every aspect of Army mission requirements. Accordingly, it is difficult to make the system acquisition process, with its attendent facility requirements, exact and definitive for all cases. Such variety makes Army program execution and management with respect to coordinating facilities and system acquisition that much more difficult.

Politics

In this era of critical modernization for the Army, there is a potential for extensive interest in "empire building" and "turf battles". The authors conclude that, despite severe resource constraints and decisions executed in extreme uncertainty of facts and data, the general attitude is a positive one, with paramount interests in the Army mission and our soldiers. Politics is not an issue in resolving the facilities problem.

Stationing/RPMA

Stationing issues are an integral part of the facilities planning cycles. Real Property Master Planning data for Army installations is neither developed or adequately distributed to the required levels to make prelimary planning a controlled process. (USAREUR installations - over 800 sites - and "facilities" are full with a 100% usage factor with possible exception of the Major Training Areas (which are being contemplated for use under redeployment plans identified under the USAREUR Master Restationing Plan) and the master planning for these installations needs at least $35M level of effort for the data to be current, totally useable and available to planners and decision makers. Facilities criteria would also have to be developed in detail and distributed for total system use. In regard to facilities it is also necessary to require more individual awareness that real property changes-upgrade or actual new construction is eventually translated into a change to the OMA (RPMA) cost. The apparently innocuous changes made under QOL had significant impact on the OMA (RPMA) accounts. Although the

modernization effort may not have so large an impact, project managers must realize that it will not be insignificant. The field is not now structured or equipped to allocate such RPMA costs to a unique force modernization issue, but the facilities issue must be recognized as a continuing one, not concluded at the construction and occupancy of the particular facility needed for a system.

The deployment of a unique new weapons system rarely has a limited and narrow effect on a post or Kaserne/community. The singular facility effect as seen from a project Manager's point of view may be the need for a new maintenance facility or upgraded ammunition storage capacity. From the point of view of a gaining command, the introduction of a single weapons system can have more dramatic effects. There can be an increased requirement for accompanied and unaccompanied personnel housing, additional administration and community service requirements, and as often as not, modified training and range needs. The deployment of a single system must be effectively and efficiently coordinated, even within the most dramatic resource constraints. The breadth and scope of the U.S. Army's modernization efforts have made total efficiency in integrated facilities planning and construction tremendously difficult.

European Forces

Army forces in Europe represent not less than 40% of our total for peacetime. Consequently, it is essential to recognize that if there are problems in facilities issues with USAREUR, it has a dramatic overall modernization effect. As developed before, Europe does have current and

projected stationing and facilities problems without modernization. Modernization therefore, exacerbates the issue. Proposals to give Europe special treatment from modernization and facilities point of view appear appropriate. See Appendix C for a detailed discussion of European Engineer environment.

RESOURCES CONSTRAINTS

The constraints on funding for systems acquisition and military construction are different and in each process, decision makers encounter different priorities. Essentially they are competing in different arenas. Until system life cycle cost definition includes detailed facility requirements, continuing difficulties will be encountered by decision makers in resolving the integrated issues.

The total resource requirement for Army modernization and facilities worldwide is more than is available in any budget and program year. Minor efficiencies are not enough. Early detailed planning and effective management integration of system acquisitions and facility requirements must be emphasized.

PM ISSUES

The PM does not control the total destiny of his system because he does not have the responsibility for execution, e.g., construction, nor access to all the resources, e.g., MCA funds. It is understandable therefore, that in addition to all else, the PM's at MS I & II tend to regard these future facility issues as beyond their control and therefore, not their responsibilty.

Field commanders need modern equipment. In this resource constrained era,

some commanders seem to be willing to accept the additional capabilities despite some facility constraints. For example, ammunition storage capacity may be limited but the additional capability e.g., MLRS, is so significant that the field commander to a degree would take the system under almost any circumstance. At this time, the "war mission" orientation by the PM works against managing the total peacetime structure. This orientation has had the effect of exacerbating the facilities issue. By the time the PM considers facilities, the time for effective construction planning is past and extraordinary management and resource allocation efforts are required. This tends to result in inefficient and ineffective management.

PMs and the total coordination structure must recognize that the problem of facilities may appear to be a issue well downstream from early critical project problems, but the fact of the matter is, that whether he likes it or not, the PM must face up to this point at the earliest opportunity to preclude deployment schedule delays due to lack of facilities. To recognize the problem is the first step. The Engineers need the facility requirements information as early as possible. With the mutual need established, the PM needs can be supported.

The management engineers and bureaucrats try to legislate the identification of facility requirements and the initiation of the planning, programming and budgeting process. Experience has shown how difficult it is to meet these needs before completion of the MS II of the acquisition process. As stated above, this is too late to preclude difficulties in what proves to be a very time constrained, severely prescribed construction

planning (to include stationing), programming and actual construction sequence. The issue can not be ignored because the facility needs can represent a large portion of the life cycle costs of the system and most importantly from an operational point of view, fielding delays can easily occur (a side note - after a brief study of the current modernization effort, it appears that no major fielding delays due to the lack of facilities have occurred - a tribute to truly extraordinary management efforts). So all the regulations and instructions have not been successful in insuring that appropriate data is available. It would appear that in this regard facilities issues are not unique.

INTEGRATION PROCESS

Mandate

As noted throughout this analysis, significant progress is being made, but the integration of facility requirements into the earliest phases of systems acquisition is not regarded as critical by all elements in the Army. It is not perceived as having been mandated. This should be extremely disturbing in that an element-facilities- which has such decided potential impact on deployment and readiness should not have to be mandated. The two linear processes need to be integrated on a timely basis. It is apparent that the recent emphasis on the ILS aspects of the weapon system acquisition and total life cycle will continue to have a positive impact on better definition of total systems costs and more effective total project management.

Effective Management

The system to effectively manage the Army force modernization integration is generally in being. Appropriate regulations and instructions

developed in response to good management requirements by the Army or in response to directives from OSD) appear to be generally sufficient to guide the general execution of the modernization effort. The inclination to tie up the "loose" ends is prompted by good judgment and the normal desire to "do-it-right."

Too few management personnel at all command, project and DA staff levels are knowledgeable or demonstrate the detailed interest in the facilities issue. Such a lack of knowledge is difficult to overcome. Therefore, the Army must utilize the existing capabilities and capacities to best advantage. This means the Engineer capabilities that exist in the USACE, to include Division and District Engineers, the DEH structure, MACOM Engineers and qualified Corps of Engineer civilians and military, must be used correctly. The current effort of the Corps of Engineers, particularly the USACE, is broad based. USACE has been aggressively attempting to overcome some significant deficiencies in MIS infrastructure. Efforts by the other organizational elements involved in the problem is critical.

DSARC/ASARC and program reviews at lower echelons seem to concentrate on system performance issues. There are growing indications that ILS factors are becoming of more interest to the reviewing elements. Emphasis on facilities issues at these reviews particularly at MS I and MS II must be increased.

A more aggressive coordination stance by PM personnel and continued complementary efforts by the Engineer community must be taken. Basically, it means more talk, earlier. More TDY expenditures would be appropriate.

The overall integrating management mechanism represented by AFMCO at DA

and MACOM level is appropriate. Functional requirements (Engineers, operations, logistics) at lower than MACOM level should be met before additional force modernization staff capability is provided. It would appear that the opposite is fact.

Performance Evaluation

A consideration of the motivation factors for the various players (e.g., PM, USACE) is appropriate to the analysis. It is assumed that each element has interest in the Army's effectiveness. However, the PM is oriented to obtaining the required system performance within dictated or assumed resource constraints. In the early acquisition phases (probably through MS II) this emphasis translates into heavier consideration of RDT&E and to a degree procurement funding issues. There is intensity in recent efforts to insure definition of better total life cycle cost and to integrate logistics support issues into acquisition. These efforts are designed to insure that the attention of the PM is spread appropriately across all issues the system life cycle. The goal is to insure that the PM's performance "rating" includes the total rather than a short sighted emphasis on issues of "his watch" only to the detriment of the health of the system after his stint.

The Engineer looks best when he knows that he has time to effectively advise the total management environment in a way which allows the required facilities to be available when needed. This means that the Engineer must have facility requirements information (stationing and facilities category data) early.

The other elements have associated pressures which influence how they involve themselves with the facility integration process.

FACILITY REQUIREMENTS - "INERTIA" FACTOR

Building facilities takes time. For every kind of facility there is an irreducible minimum length of time required from the realization of the need and decision to construct it to the completion of a facility ready for use. Increased emphasis on the earliest possible detailed development of facility requirements and criteria is necessary.

The operational requirements for new systems make fielding sufficiently high in priority to preclude the cost of facilities (usually no more than 5-10% of the life cycle costs) being a driver for delaying systems fielding. As a matter of fact, in at least one command, USAREUR, the mission requirements for new systems take priority over many quality of life construction projects. Another element of the construction process does and can become a significant factor in effective system deployment. The time scale for this process for new systems can take as long as seven (7) years before the required real property is available for fielded systems.

Essentially, the facility requirement becomes a time "inertia" factor if not considered effectively in the earliest phases of system acquisition. The attitudes of all participants toward Army fielded systems exacerbates the adverse impacts of delayed facilities planning. The result of delaying adequate facility definition is a requirement to execute the construction planning and programming efforts on an extraordinary management basis.

The efforts by Engineers in USAREUR in the execution of planning and programming for PATRIOT, DIVAD, M-1 and MLRS are excellent examples of such required extraordinary management.

There is a time inertia aspect involved in the facilities element of the overall systems acquisition process which is not appreciated by the Army at large.

"MUDDLING THROUGH"

The DOD Directive 5000.39 and AR 700-124 are specific in the area of facilities. The Army has incorporated OSD guidance concerning facilities issues into the ILS segment of management. The guidance left open the "how" for executing this responsibility. The options available are somewhat constrained to the general structure of Army management as it currently exists - The Corps of Engineers, DARCOM, TRADOC and other MACOMs. A dramatic reorganization of involved organization elements or management procedure is not appropriate.

Responsibilities for facility issues have been assumed to be the unique function of the Engineers. This includes unfortunately, a perception that when the system is ready for fielding that the Engineers will quickly meet facilities needs.

Essentially the Army has been "muddling through" the effort quite effectively. Responsible people and action elements are working the problems and are making the system work. It appears, however, that the "muddling is slowly evolving the Army structure to a more efficient mechanism.

SINGLE POINT FAILURE POTENTIAL

The FE or DEH at the Post or community level must initiate the required formal documentation for the construction effort. The 1391 is developed with facility requirements provided by the mechanism which defines the unique needs

for the specific weapons system (e.g., maintenance area criteria, parking area criteria, handling devices such as overhead cranes, ammo storage criteria). The 1391 documentation must be provided by the local Engineer to insure unique stationing requirements are recognized and that the gaining command can justify the funds required for construction.

This point of contact therefore has the potential of being a critical point of failure. If the critical technical Engineer information flow has not been provided in a timely manner the results are delays and improper planning and programming. (Figure 8)

A good example of just this result involves the PATRIOT program. That system enjoys a high, if not the highest, deployment priority of all our new systems. The stationing issue in USAREUR was complicated and continues to be complicated by some early misunderstanding of the facility criteria for the system. The technical information channel was activated and the issues started to sort out. (A side note-the programming for construction was complicated by use of various sources of funds - MCA and NATO Infrastructure.)

The development and enhancement of a mechanism to provide facility criteria to all echelons of the Engineer establishment is critical. A system exists but it must be "tighter" in terms of response to the needs of the field.

GAO/AAA INTERESTS

Extensive interest in the Army modernization program is being shown by government audit organizations. After only a brief review, it appears the derived lessons learned and basic recommendations provide no new and additional insight to manangement efforts already underway by the Army.[1]

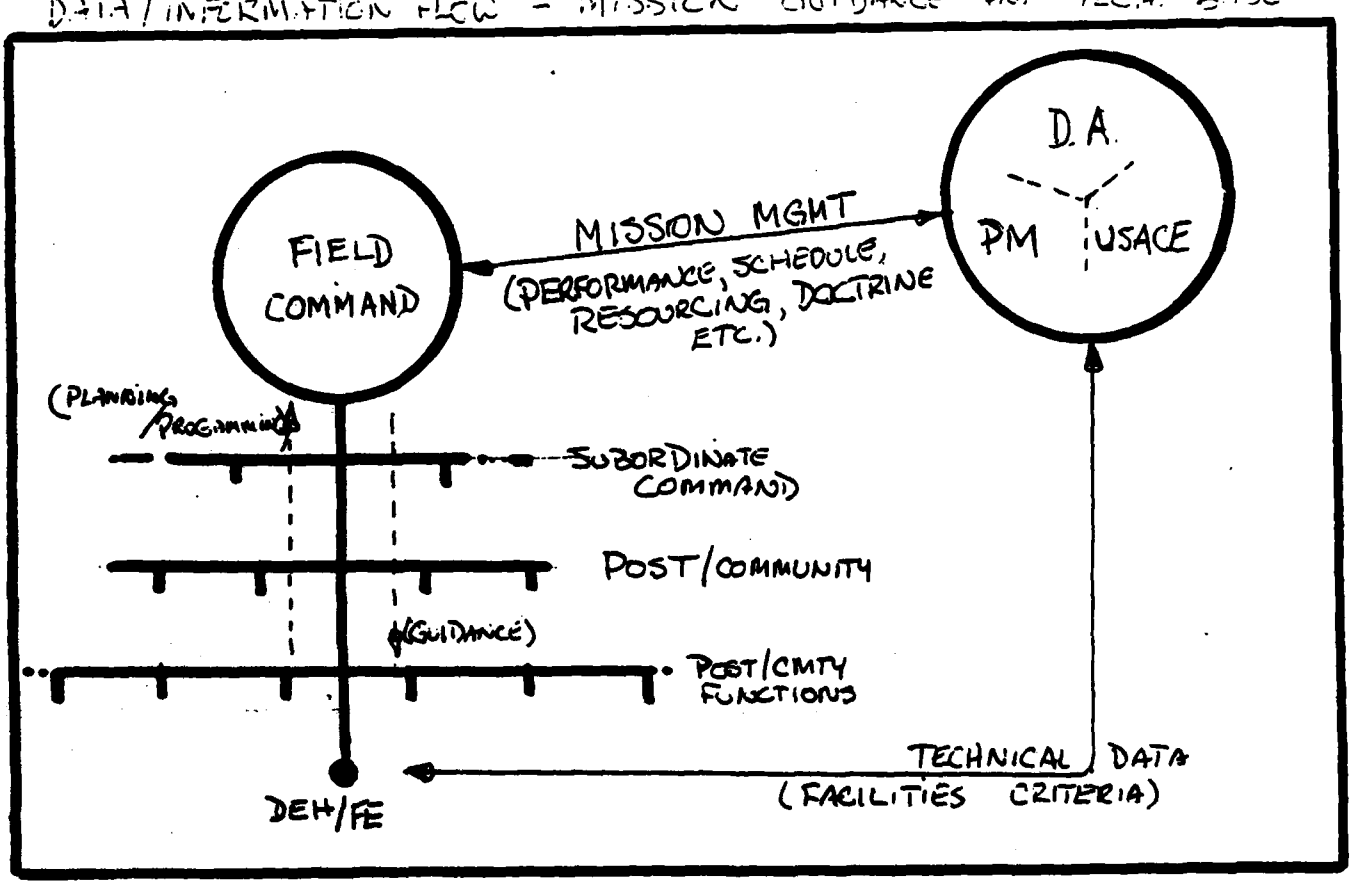

DATA / INFORMATION FLOW - MISSION GUIDANCE TO TECH. BASE
D.A.
PM
USACE
FIELD COMMAND
MISSION MGMT
(PERFORMANCE, SCHEDULE, RESOURCING, DOCTRINE ETC.)
(PLANNING/PROGRAMMING)
SUBORDINATE COMMAND)
POST/COMMUNITY
(GUIDANCE)
POST/CMTY FUNCTIONS
TECHNICAL DATA
(FACILITIES CRITERIA)
DEH/FE

Figure 8

PROPER FORESIGHT:

At very best it is difficult to describe the facility requirements for a new system at the concept exploration phase of the systems acquisition process. The authors recognize the significance of this point. If the configuration of modern equipment is difficult to prescribe in early stages (up through MS I), it is well appreciated how much more difficult is facility definition. This point is not lost on the pertinent elements of the USACE. The integrated study of the problem by PM and USACE (or a uniquely qualified facilities man in the PMO) is critical and only then can the overall process insure effective facilities planning.

One of the frustrating aspects of this study has been the continued recognition that there is not a single recognized responsible command element for coordinating the facility aspects of the field needs for a single weapons system. When things go wrong - a washrack doesn't meet a systems total needs or sufficient power is not available, or not enough family housing is on hand to accommodate a new unit - it is very satisfying to be able to identify the "guilty" management element to insure the circumstance can be corrected. But this situation does not exist. It remains to tighten up a total system, any element of which has unique problems. A system management approach is necessary and generally followed during systems acquisition. But it is recognized that a system management approach, similar to that used in acquiring the system, must be maintained throughout the total life cycle. As noted above, it is concluded that a system exists which puts the management structure to bear on all aspects of the problem. The system does need to be

made to react more aggressively.

The introduction of the many new weapons systems into the field and the commensurate force structure modifications to make an optimum organizational/equipment balance for combat effectiveness (Army '90) has required that there be an significant enhancement of coordination among the system acquisition, readiness, real property, construction, and support, and PPBS environments.

In a severely constrained resource environment, the coordination of system acquisition and construction programming and budgeting is necessary to preclude extreme schedule divergencies. The coordination should be a balanced one. PM and Engineer have a vested interest in aggressive mutual coordination. Each party benefits from meeting the other more than half way. Each element has the responsibility to do so. The Engineer should be given sufficient time and guidance to be capable of providing the needed facilities. The Engineer does not establish the priorities.

FOOTNOTE (PAGES 37-50)

CHAPTER V

[1]Interviews with Mr. Foster, DARCOM, 22 September 1982; LTC Mihols, TIG, 15 October 1982; Mr. R. Heller, BLACKHAWK PMO, 24 January 1983; Mr. D Gardner, MLRS PMO, 25 January 1983; MAJ Millar, PATRIOT PMO, 26 January 1983.

CHAPTER VI

HISTORY - TO BE REPEATED

PACE OF MODERNIZATION

The potential pace of modernization of weapons systems has been increasing since the 1950s. The response by the U.S. Army has been to slowly evolve new systems and then steadily upgrade their individual capabilities through subsequent subsystem replacements or product improvements. The organizational structure of the Army has also evolved. Over the last twenty years two very significant efforts to modernize have occurred and we are still experiencing the second modernization thrust. By any standard, the current program will have profound impacts on how the Army will organize and fight. The new doctrine, Airland Battle 2000, with its attendant organizational restructuring, DIV 86 and CORPS 86, demonstrates the depth and breadth of the effect of the current modernization program. The process is a continuous one and because of the nature of modern technology innovations, the pressure to acquire new systems will continue to be strong.

FACILITY ISSUES REVEALED

After study, it is concluded that the Army's modernization effort has only recently (since 1980) put the spotlight on facility needs in relationship to modernization. In the 70s, the quality of life (QOL) for our soldiers dominated the considerations for facilities. Although QOL facilities problems have not been totally solved,[1] they are now being replaced in priority by facility aspects of the Army's modernization program. Through FY 75, MCA for

modernization was relatively insignificant. In FY 83, almost $0.25 Billion (24% of MCA) is budgeted with a projected increase of 48% for FY 84 with a similar level of expenditures continuing for the near future.[2] In addition to the increases in MCA funding, increases are occurring in Family Housing (27% increase) and RPMA (18 % increase) accounts which reflect the drive to support all requirements for modernization. The total Engineer budget (MCA, FHMA, RPMA) for FY 83 is $4.3B.[3] At this point, we are only just now tightening up our planning and coordination activities to insure that facilities issues don't overwhelm us. We should have anticipated the surge in facilities activity and developed the necessary management controls in advance.

In fairness, there are some reasons for this seeming lack of foresight. Only with the current administration are funds being made available to effectively execute the desired total program. In 1981 MACOMS found themselves confronted with the need to program and budget for facilities to support systems which had little or no program support in earlier years (e.g. [illegible]). Previously, insufficient resources were identified for all programs to meet fielding schedules needed for maximum operational effectiveness. The PMs were asked to sharpen management of functions for which, because of inadequate resources, they had been unable to meet the total planning and coordination requirements. Inadequate resources, insufficient planning, or over ambitious program scheduling or life cycle cost projections, or more likely, a combination of them all, provided a poor basis for facing a situation where suddenly facilities and facilities functional management have become a constraining issue on system deployment.

STUDY APPROACH

Our study philosophy was developed to look at our current situation in a manner which could give fair play to consideration of the wide variety of parameters involved. The portion of our analysis devoted to unique systems was designed to give insight to impact of timing on ability to execute management control in the facility requirements and planning functions. The systems selected provided a basis for obtaining insights concerning the impact of system acquisition status on facility requirements. The timing seems to have little effect on facilities planning although systems which are now in early development phases seem, not surprisingly, more effective in developing the facilities issues without a great deal of intense effort.

THE FUTURE

The Army is now institutionally and philosophically more able to handle the facility issues of the current modernization program. Congress (and OSD) and selected decision authorities in the DA have determined that not only will the issues be planned, but they can and will be well managed. However, will the pressure be maintained on future modernization efforts of the Army? Detailed policies and management information systems are now in place or being developed to more deeply entrench the institutionalization of the issue. Full implementation of the techniques and philosophy detailed in Chapter V will help. Further, we must resist the temptation in the future to "gut" organizations which would return us to the difficult position we have faced for the last three (3) years.

FOOTNOTES (PAGES 52-54)

CHAPTER VI

[1]Department of the army, The Army Budget, Fiscal Year 1984, Comptroller of the army, January 1983, p. 71.

[2]Ibid., p. 73.

[3]Ibid., p. 71.

CHAPTER VII

CONCLUSIONS

After analysis and evaluation of material obtained during the research, the following general conclusions were reached:

a. The Army's system to modernize, to include new weapons, equipment and organizational restructuring, and meet the associated facility requirements for that modernization program, is generally in place to anticipate, fund and construct the new facilities which are required when fielding is initiated.

b. Facility requirements have not in general been anticipated and adequately scoped during new systems development to insure facilities availability during final fielding.

c. Too much extraordinary management effort has been necessary to guarantee facilities availability.

d. Certain management control mechanisms either are not receiving enough emphasis or are not sufficiently developed to guarantee effective facility requirements development.

e. The systems acquisition process which is event driven and the construction management process which is time driven have some significant potential mismatches.

f. Extensive management efforts are necessary to minimize these mismatches.

g. The PM has no responsibility for execution of facilities construction except in development of facility requirements. Increased emphasis on the critical nature of this function is therefore necessary to insure the PM effectively executes this mission.

CHAPTER VIII

RECOMMENDATIONS

a. Increase efforts to coordinate an integrated management of facility requirements into systems acquisition programs by increasing USACE and MACOM engineer support to the PM at earliest possible phases of system development.

b. Provide funding on expanded basis for this purpose to the PM for reimbursement to appropriate Engineer activity(s) with mission support designation for resources.

c. Increase visibility of facility requirement management efforts for modernization. As a minimum, increase attention at program reviews, e.g., ASARC, on this issue.

d. Require detailed development and presentation of facility requirements factors during program and resource reviews of system and organizational modernization efforts. The total life cycle costs with respect to facility requirements should be presented at IPR's and for first time not later than MS I in the system acquisition cycle. Detailed development of facility requirements as required by the DODD 5000.39 should be closely controlled.

e. Increase the resources allocated to facility requirements related MIS programs, e.g., IFS, DSS, ASIP, FSP, to insure earliest availability of data base and technical information to all levels of program review and execution.

f. Increase management efforts to incorporate detailed facility requirements factors into every MIS element of sytems acquisition, e.g., MOBES, ILS, LSA, LSR, MFP.

g. Increase management efforts to incorporate detailed facility requirements factors into MIS elements of PPBS and total modernization program, e.g., AMIM, MRIS, FMMP.

h. Insure development and maintenance of channels to provide detailed technical facilities data to lowest echelons of Engineer support (DEH) in the MACOMs.

i. Investigate the potential value of redistributing the Force modernization manpower spaces at command levels below MACOM to funtional support elements, e.g., Engineers, logistics, resource management, within the command.

APPENDIX A

SUMMARY OF INTERVIEWS

1. 17 September 1982, 1500 hours. DA, Office Deputy Chief of Staff, Research, Development and Acquisition (DCS/RDA). POC: Col. R. Lipinski, LTC T. Farewell. (3C364/693-57653)

SUMMARY: Issue requires.."Senior leadership to go to school..Turf barons to stand back...recognize enemy is us..." Force Modernization Master Plan is part of MIS and as such is only a reporting system and not well understood by management. Total process of system acquisition, functional interfaces, and general management is disjointed with significant disconnects. Linkage back to PMs poor. Significant data base problem.

2. 22 September 1982, 1400 hours. HQS, U.S. Army Materiel Development and Readiness Command (DARCOM). POC: Mr. R. Michellon, Office of Project Management.

SUMMARY: Discussion of basic ILS requirements and related facilities issues with respect to army system acquisition. PMs have required Asst. for ILS since early 1970s. If funding (PPBS) isn't in sync with system acquisition and construction cycles, problems result. Funds may go elsewhere. MIS to manage project manager/systems generally in being. DA, DARCOM, MACOM, POC system being developed.

3. 22 September 1982, 1500 hours. HQs, U.S. Army Materiel Development and Readiness Command (DARCOM). POC: Mr. R. Foster. Modernization Management Division, Supply, Maintenance and Transportation Directorate.

SUMMARY: CSA/VCSA guidance in facilities and modernization in 1980. Facilities Spt. Plans started by ACE/OCE. AR 700-124 (ILS) put OCE in process. Life cycle costs (LCC) development by most PMs not include much MCA needs initially because LCC balloon with everything else. Result-program hurt. PM should have acquisition job only. Feels facilities issues in total too much for PM. Discussed mismatches between MCA and acquisition cycles. DARCOM/OCE had told PMs in 1981 to use engineer capability from Huntsville Division Engineer. GAO/AAA continue to show interest in Army modernization efforts.

4. 29 September 1982, 1400 hours, 14 February 1983, 0900 hours. DA, Office Assistant Chief of Engineers. POC: Mr. D. Eaton, Facilities Requirements Planning. (IR677/697-9567)

SUMMARY: Army Force Modernization being studied by TIG. One systemic problem-facility requirements. MIS and mechanisms being established to bridge gap between PMs and Engineers in MACOMS. (e.g., Facilities Support Plans). Part of bigger effort which includes AFMCO. ILS down played-doesn't know why. Europe (USAREUR) is particularly difficult problem. Data base inadequate.

5. 29 September 1982, 1500 hours, 14 February 1983, 1130 hours. Hqtrs. DA Office, Army Force Modernization Coordination Office (AFMCO). POC: MAJ W. Keenan. (1A871/6955811)

SUMMARY: AFMCO structure fills gap at DA - ODCSOPS/ODAS. Force Modernization Master Plan in process. MIS vehicle. LCC-Size of problem isn't changing, we're only now putting it together. Total system fielding management. Functional PDIP development needed.

6. 21 October 1982, 0830 hours. Office, Chief of Engineer. POC: COL Paul Theuer, Office, Miltary Programs Directorate. (Pulaski Bldg. 3137/272-0392)

SUMMARY: Solution to facilities for system in various stage of development/fielding. OCE organized to help. Engineer need to be broadminded-interaction required.

7. 21 October 1982, 0930 hours. Office, Chief of Engineers. POC: Mr. D. Baldwin, Office Director of Military Programs. (3114/272-0416)

SUMMARY: Force Modernization studies by AAA, TIG. Engineer support to PMs structure is developing. Need assistance not only in weapons system development but in facilities planning for TOE/TDA change and facility category code development. DA must give priorities for FSP developments. Europe has biggest problem. New systems developed undertime compression in acquisition process will make facilities planning interfaces even more critical. Data base portion of MIS is biggest part of facilities planning problem.

8. 15 October 1982, 1430 hours. DA Inspector General (TIG) POC: COL W. Gavin, LTC Mikols, LTC Gentili.

SUMMARY: CSA mission in 1981 to make systemic analysis of Army's Force modernization effort. Two edged sword-competition for same resources-(re-equip a/o re-organize). TIG took look at Army's functional life cycle using vertical (by systems) and horizontal (by functions) slices. In area of facilities investigation revealed as "driver." There are disconnects. and probably existing system can't go fast enough. Too much of a manual process for MIS-Results in delays. ILS (or ILS like) needs to be pushed. TRADOC's role in early ILS efforts critical. TIG proposed recommendation being developed. AAA continues to show interest in modernization effort with some strong emphasis on facility requirements issues.

9. 5 November 1982, 0900 hours. DA, Programs Analysis and Evaluation Directorate (PAED) POC: COL L. Capps, Acquisition and Support Programs Division.

SUMMARY: Internal Army (U/Sec initiative) efforts to identify total life cycle cost impacts on programs and priority decisions. Systems costs need to be recognized as seen difficulty by the actual costs, PPBS, Functional PDIP, and PM. Respectively the final funding might be broken out in 100%; 80%, 60%, 35% slices which mean the PMs responsibilities are made most difficult. MCA typically seems to work out 5-10% of final requirements.

10. 5 November 1982, 1200 hours, 17 December 1982. DARCOM. POC: COL G. Kourakos Development Engineering and Acquisition Directorate. (8N54/274-8620)

SUMMARY: Staff relationships among commands to manage systems acquisition process getting better. Staff capabilities at DARCOM excellent in the area. Not totally in control of facility problems related to systems acquisition. Micro management by OSD and Congress perceived as increasing. Will provide interface with any project through his staff.

11. 5 November 1982, 1300 hours. Hqtrs. DARCOM. POC: Mr. C. McPherson, Management Information System Directorate. (4E08/274-8952)

SUMMARY: Management information systems deficiencies exist in the area of facility requirements interfaces with systems acquisition over and above problems within the two individual functional areas. Better MIS would ease the requirement for a large depth of qualified personnel. Would ease issue often expressed as follows: PM..."I don't have any people to address (facilities) problem but you don't have anyone qualified on my problem to give information in time to influence design either..." Overlapping life cycles and money targets lead to time disconnects-System to manage efforts are linear. MIS must therefore be responsive. Need qualified, experienced, "systems" engineers. Centralized MIS on large scale essential.

12. 5 November 1982, 1500 hours. U.S. Army Mobility Equipment Research and Development Command (MERADCOM) POC: Mr. Alan O. Elkins. PM UET/M9M/ACE.

SUMMARY: General discussions on the problems of a typical (albeit small) PM. Significance of the role of the ILS planning and management and effects on system acquisition. Determined in beginning of program that the constraints on facility issues are "too loose". PM should get a "check list for facility constraints." Should take advantage of contractor's inclination to not put up proposals for equipment which is not really totally new and unique. Importance of strong ILS section in PM, both military and civilian.

13. 29 November 1982, 1300 hours. Defense Systems Management College. POC: Dr. S. Staley, Mr. P. McIlvaine, Professor of Systems Acquisition Management. (DSMC Bldg. 207)

SUMMARY: Discussed doctrine taught by DSMC on functions like facility requirements within the systems acquisition process. Emphasized role of ILS and the role of facility requirements functions within that system. MILSTD 1388. PM must use RDTE funds which are hard to get. Not deliberately but some good point. Always question --How is performance of each participant measured. Since criteria for each element is different, each can provide insight to interface and coordination problems. Design engineers must be sensitized early. In matrix management structure find who is making decisions on resources and priorities and will find critical points. ILS/facilities must be issues at ASARC/DSARCs.

14. 29 November 1982, 0930 hours. Hqtrs. U.S. Army Training and Directorate Command (TRADOC) Telephone discussions: POCs: DCS/CD LTC E. Ames (A)-680-2166), Force Modernization Div.; COL E. Madigon (x 4162) Sys. Mgmt. Div.; DCS/RM, COL Weihl (x 2122) Program Analysis Div.; DCS/ENGR.-COL J. Adams, LTC Morrola, Mr. Sperrzo. (x3424, 2242); DCS/OPS-LTC Hedrick (x 3568) Mobilization Branch.

SUMMARY: Results of telephone discussions. Role of TRADOC in early phases of PM efforts critical, especially in ILS development. Facility requirements barely visible until recent years and still deferring to Engineers because of lack of MIS information.

15. 24 January 1983. PM BLACKHAWK. TSARCOM POC: COL R. Anderson PM. Mr. R. Heller, Deputy PM, ILS ((A)-693-1813/16), 4300 Goodfellow Blvd, St. Louis, MO 63120,

SUMMARY: Detailed discussion of ILS issues. No current facility related problems presented (not aware of power problems being addressed by USAREUR to assist in fielding UH-60s to Europe). Materiel Fielding Plans mention facilities but no significant problems. Management Fielding Teams in USAREUR have only minor difficulties. Excellent insight to relatively mature program. Pressures on Deputy PMs for ILS are considerable. Not usually staffed appropriately. Feedback to PMs not sufficient. GAO/AAA have been to PM.

16. 25 January 1983. PM MLRS, MICOM. POC: Mr. David Gardner, Deputy PM/ILS, ((A)-746-8296), Bldg. 5250, Redstone Arsenal, Huntsville, AL 35898.

SUMMARY: Excellent presentation and subsequent discussions on system to be deployed in early FY 83. MLRS was accelerated development system. Materiel Fielding Plan was developed with full knowledge of facility deficiencies in USAREUR. PM frustration-can't influence resources at deployed command. All PMs are unique because of the circumstances of their individual system, technologies and time schedule. PM can't do it all. Had seen Huntsville Engineer Division but too late to circumvent problems. Force Modernization Master Plan from AFMCO is useless to PM (but only one element of MIS). System moves too fast to keep MIS up to date without additional resources. GAO/AAA had been to PM.

17. 25 January 1983. PM PATRIOT, MICOM. POC: Mr. A. Compton, MAJ Millar, Dpty for Mgmt. ((A)-742-3030), Safeguard Building, Redstone Arsenal, Huntsville, AL.

SUMMARY: Excellent presentation and subsequent discussion on system in last stages of initial procurement. Fielding Plan with full appreciation of facility requirements, particularly in Europe. Total appreciations of problem. Extended period of system development has enabled the Engineers to overcome significant time problems to get field facilities planned and budgeted. Site selection teams should be used to front end the MFP. Depot maintenance and training facility examples of some planning which goes unnoticed too long. Nature of facilities planning, budgeting and construction in Europe presents significant problems (NATO Infrastructure finding, power coordination, land acquisition). Facility requirements for system like PATRIOT represent tremendous stationing issue to MACOMS, ASARC/DSARC issues represent primarily performance problems although ILS/ facilities has been point of effort recently. Factors which "jerk" the system are usually beyond control of the PM and/or the Engineers. Total Life Cycle Costs for systems are fairly well in hand but the effort to put E (for Execution) into the PPBES is appropriate and will, after the fact, give insight to our system. Usually not enough facility details in MFPs to satisfy requirements. Definitely need Engineer help. GAO/AAA had been to PM.

18. 26 January 1983, 1300 hours. Huntsville Division, USACE. POC: COL W. Lee, Dpty Div Engr.

SUMMARY: Insight to interactions with PMs by an Engineer was provided. Engineers can't be reticent in assisting, and offering assistance, to PMs. Concludes we are too wrapped up in who is responsible, who pays to what, at present time. However funds are channeled, through the PM for reimbursement to Engineer or direct to Engineers, problems occur. But low level orientation to this issue is appropriate. PM wants "something for nothing". Engineers can't produce on that basis. Results must be changed.

19. 9 February 1983, 1500 hours. OSD/Asst Sec for Manpower, Resource Affairs and Logistics, POC: Mr. J. Asceri, (756-2333/Skyline Towers II), Office D/AS (Log and Mat'l Mgmt.).

SUMMARY: Detailed discussion on OSD policy and directives on ILS and perceived relationships between facility requirements issues and system acquisition management. DODD. 5000.39 and MIL-STD-1388-1A.

17 February 1982. Congressional Staff. POC: Mr. T. Peal, HAC Staffer and Mr. J. Smith, SASC Staffer.

SUMMARY: Systems acquisition and deployment management within services needs builtin facility requirements planning, essentially master planning. The many changes in the MILCON budget requests to Congress reflects this. Army needs to do this more. Army's problem of deployment is more difficult than other Services but planning function still needs work. Gave high "marks" for recent efforts to resolve problems. Division of responsibilities between Engineer and PMs seen as contributing to problems Engineers needed at every stage of PM process. LCC initially identified by PM are too much of a "SWAG". Planning is critical issue.

21. Numerous Telephone Discussions. Hqtrs USAREUR, Office DCS/ENGR. POC: LTC Ritz, Mgmt Div and MAJ Asta, IP Div.

SUMMARY: USAREUR Modernization program severely constrained to facilities issues. Stationing complicated by desire to move units to better locations operationally. Installations (800) already crowded and in poor repair ($1B Maintenance backlog). Tremendous backlog of construction requirements ($8 B). Weapons systems scheduled to arrive in near future have required extraordinary management efforts to plan program and budget facilities construction. Issues perceived as to be resolvable much earlier and without less extra management effort-particularly on part of Engineers.

APPENDIX B

THE MCA PROCESS

INTRODUCTION

This appendix is an extract from a DA study called the MCA Cycle Study.[1] The MCA process is really not a cycle, but a process since it starts with the need for a facility and ends with the completion of the construction of that facility. DA staff members frequently call it the MCA cycle because of its interaction with the PBBS cycle.

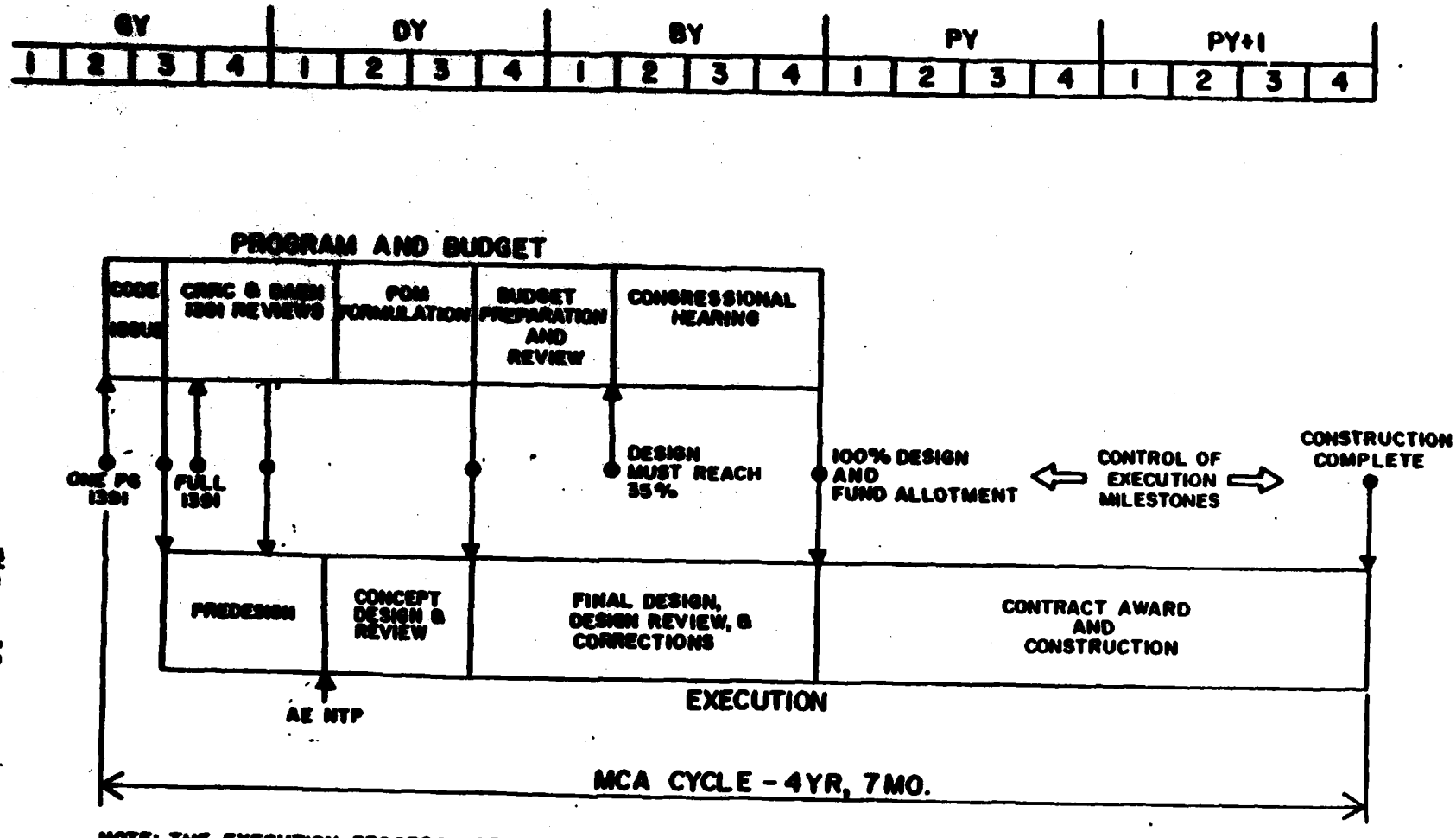
Program and Budget and Execution Processes Interactions

Figure 10 shows a simplified MCA cycle consisting of two distinct processes, the program and budget and the execution. Receipt of one-page DD Forms 1391 (1391) from MACOMs and completion of construction activities in the field define the MCA cycle covering approximately 4 years and 7 months. The two processes are related in that the program and budget process sets the pace of and controls the execution process (via the milestone controls shown in black dots in the Exhibit). Note that positions of Code 2 and Code 6 controls are approximate since issuance of these codes is planned over a period of time. Also note that the execution process is not time-scaled except the contract award and construction phase may begin 1 October, Program Year, and last for 24 months. The earlier execution phases are simply positioned according to milestone controls which govern the beginning or end of the phases.

MCA Cycle Synopsis

By 1 March, Guidance Year (31 months before the beginning of Program Year), MACOMs formulate their initial programs and submit one-page DD Forms 1391 to Headquarters, Department of the Army (HQDA) (Construction Requirements Review Committee [CRRC] for review. Based on this submission, HQDA (CRRC) formulates a preliminary Army Program (Army-wide prioritized program) in March and April, and releases projects for Code 1 activities. This preliminary CRRC decision is the basis for Department of the Army, The Office of the Chief of Engineers (DAEN) direction of Code 1 activity to District. It is also the basis of MACOM/Installation submission of full DD Forms 1391 to be submitted in three increments beginning 1 July. Code 1 directives, furnished to design offices in mid-May, authorize site investigation, preparation of preconcept control data, advertisement in Commerce Business Daily, selection of architect-engineers (A-E), and some other predesign activities. Code 1, however, does not authorize notification to A-E of selection. Notification of A-E must wait for Code 2 authority.

Full DD Forms 1391 received in the July-September period undergo two separate but largely concurrent chains of review by CRRC and DAEN before



NOTE: THE EXECUTION PROCESS NOT TIME SCALED

Figure 10

THE PROGRAM AND BUDGET AND EXECUTION PROCESSES OF THE MCA

projects are released for concept design. The CRRC review is to establish programming essentiality of the project, while the DAEN review is to assure technical data accuracy or sufficiency. A project must clear both reviews to be released for concept design. Note that the two reviews employ different review disciplines; that is, CRRC reviews by Facility Class and Construction Category (i.e.,by the Project Proponent), whereas DAEN reviews by the order of 1391s received. As a result, technically released projects often wait for program release from CRRC, and vice versa, before design is authorized.

Thereafter, the projects go through Program Objective Memorandum (POM), budget preparation and reviews and congressional hearing steps at HQDA and higher headquarters, ultimately resulting in Military Construction Authorization and Appropriation Bills. Three execution controls related to this period are: the Code 6 design authority, the 35 percent design status requirement of Congress, and the 100 percent design status requirement of the Office of the Secretary of Defense (OSD). Code 6, which approximately coincides with the HQDA formulation of POM, provides authority to proceed on final design. The purpose of Code 6 is to limit design fund expenditures to those projects that are likely to pass later scrutiny by higher headquarters, but the very existence of the code gives design a go-stop-go phenomenon, which has the effect of discouraging design offices to move ahead on design activities. The 35 percent design status requirement mandates that the projects reach the 35 percent design status when the MCA program is presented to Congress. Its main purposes are reliable project cost estimates and assurance of contract award in the programmed year. However, a recent Comptroller General study reports that "cost estimates based on at least 35 percent design were somewhat closer to the (100 percent design) Current Working Estimates," but that "this is not the case for all projects." Note that the 35 percent design status requirement has the effect of extending the design execution process, thereby exposing it to further programming and budgeting turbulence because of the earlier-than-necessary design start to satisfy the requirement. Finally, the 100 percent design status requirement is a management tool used by OSD which requires that 90 percent of the approved MCA projects reach 100 percent design status at the beginning of the program year.

Code 2 authorized concept design action by design offices includes: AE contract negotiation, contract award, design, design reviews, and coordination or review comments. Initiation of these activities, however, depends on availability of both a good Project Development Brochure (PDB) and design funds. (The PDB has been a major problem in the past; the revised AR 415-15 corrects the problem by requiring the Division to review and clarify the PDB prior to issuance of Code 2.) Code 6 authorized final design action, but it does not authorize advertising construction in the Commerce Business Daily. Advertisement requires separate authority. Receipt of authority to advertise (with or without funds) signifies the beginning of the construction phase. At that point, the constructing office may complete most preconstruction

activities such as advance notice to bidders, bid document preparation, government estimates, advertising, bid opening, and preaward survey. Contract award must await receipt of fund allotment documents. Thereafter, construction begins and the assigned Area/Resident Engineer office monitors the work. The rather excessive construction modifications are notable. For instance, the 1979 report by the Surveys and Investigation Staff, House Appropriations Committee shows that the projects completed in FY 77 experienced some 5,800 contract modifications at a total cost of $49 million, with an average increase of 8.3 percent of the original contract prices and an average of 13.5 modifications per contract. In FY 80, modifications exceeding 3 percent of the original contract amount totalled $19 million for the first 4 months. No doubt these modifications cause significant slippages in construction schedules. Design deficiencies, user changes, changed criteria, and differing site conditions have been among the most prevalent reasons cited for modifications, with design deficiencies have the highest frequency and being the most costly. It is interesting to note that the Corps' vast experience with MCA construction and extensive MCA design review do not abate the problems of design deficiency.

User Views of the MCA Cycle

The MCA cycle described above represents the cycle structure as laid out in AR 415-15, and as such portrays the ideal situation. However, the facility using services, Installations (INSTLs), and Major Army Commands (MACOMs), may see it quite differently. For instance, the user may instead perceive a cycle much longer than the one of 4 year 7 months shown in the Exhibit. Reasons for such a perception by the user may include the following:

(1) At the installation level, the MCA cycle really begins in October, Guidance Year, when program guidance from MACOM is received. Installation facility engineers begin to collect and assemble project data and prioritize projects for 1 March submission to HQDA. This lead time adds 5 more months, making the cycle a full 5 years long.

(2) The 5 year time period required to get their projects completed may seem too long. FY 79-83 MCA programs show that small size projects costing less than $1.5 million represent the bulk of annual MCA programs, an average of 55 percent in number of projects, and installations waiting five years to see them completed may well consider 5 years excessive, especially compared to private industry standards.

(3) Many of the installation MCA projects thus submitted do not survive the intense competition and scrutiny of the program and budget process, and their construction does not begin in the original program year. Falling out from the original cycle and migrating into the next is a common occurrence. To the user, each dropout extends the MCA cycle by at least one year because the project has to wait for the next cycle for resubmission or

reconsideration. Some late dropout projects, especially those passing the DA POM before falling out, do not make the next cycle and wait 2 or more years to continue through the program and budget process. Figure 11 shows three possible alternate MCA cycles into which dropout projects may migrate. Certain projects experience repeated dropouts. To the user, the most painful aspect of project dropout is that it has been common for projects related to capital plant investment and upgrading, which installations consider essential.

(4) Slippages in design and construction schedules extend the construction end of the cycle. Slippage in design schedule affects the construction schedule to the extent that the 100 percent design completion date passes by the date of 1 October, Program Year, and thereby bulges into the construction execution phase. This slipped design complete date plus the original construction schedule and schedule slippage extend the MCA cycle far beyond the end of Program Year Plus One (PY 1).

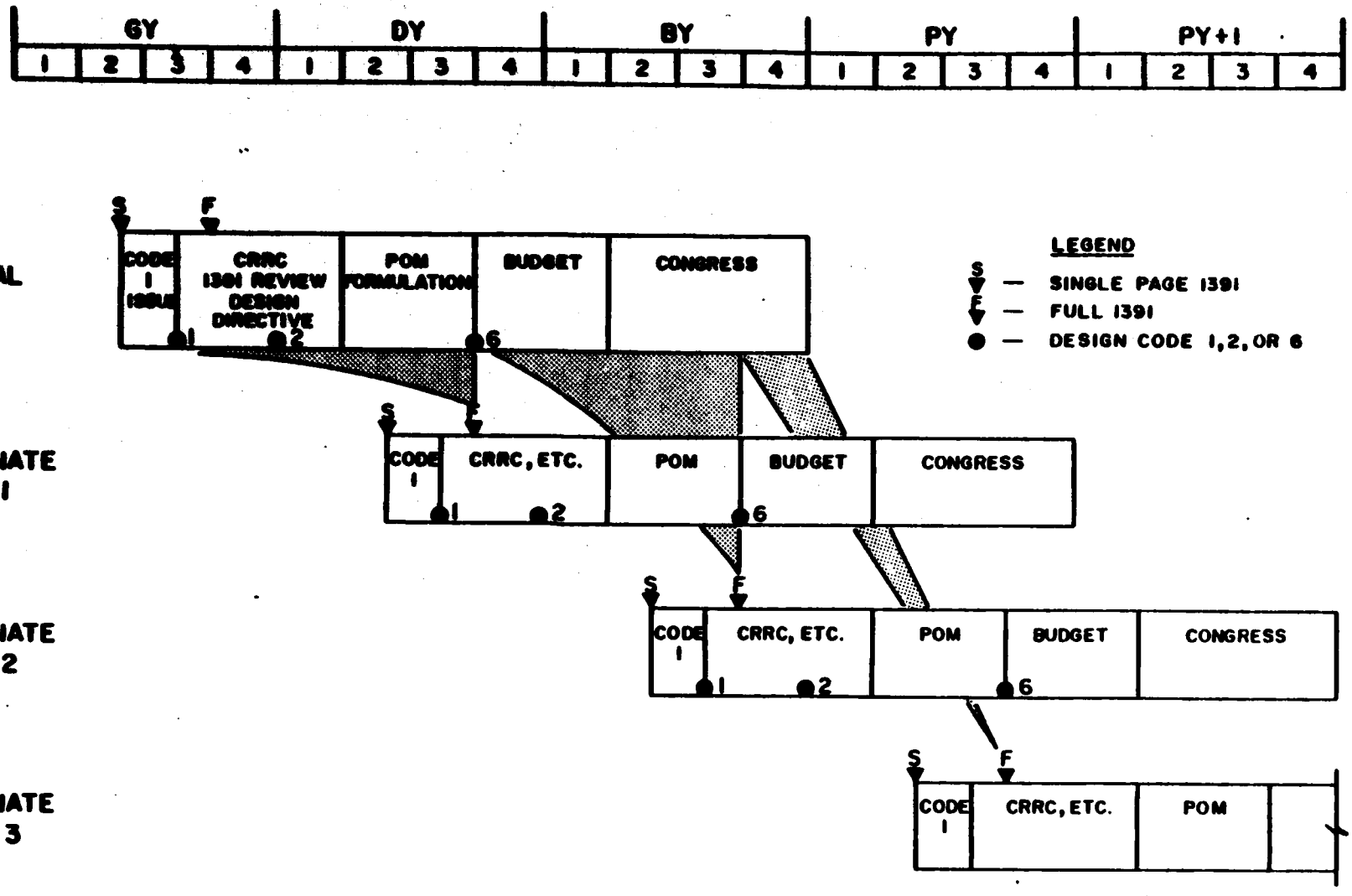


Figure 11

MIGRATION OF MCA PROJECTS

FOOTNOTE (PAGES 66-71)

APPENDIX B

[1]DA. MCA Cycle Study: Ways to Shorten the MCA Cycle. CERL, September 1981, p. 5-1.

APPENDIX C:

EUROPEAN ENVIRONMENT[1]

General

Not only does the European experience the same MCA problems encountered in CONUS, but these problems are intensified and augmented by complicating factors arising from the European political, institutional, cultural, and physical environment. A number of problems stand out in bold relief when viewed in a European context.

Complicating factors affecting the MCA program include:

Dominance by a single MACOM (HQUSAREUR) that is on a brink-of-war-footing and has overburdened engineer resources throughout the command.

Many small scattered installations, causing real property planning and management problems.

A Corps level division office performing district office functions and augmenting Director of Engineering and Housing (DEH) functions.

Recruitment problems, a combined work force of local nationals (uncleared) and short tour U.S. citizens, which affects communication, continuity, and stability.

Interaction with NATO, involving added communication, programming, and procedures.

Conjunctive funding (MCA, NATO Infrastructure, and Host Nation [HN]), and its associated administrative, technical, and facilities delivery problems.

DOD construction responsibility for a multiplicity of NATO nations, with a consequent multiplicity of agreements. languages, cultures, customs, laws, engineering practices, and currencies.

Land scarcity and more stringent environmental policies. The majority of work is being conducted in the Federal Republic of Germany (FRG), in a 98,000 square mile area (Wyoming size), containing 61 million people (10 times the U.S. density).

Historical problems of artifacts (structures, ammunition,...), antiquated Wehrmacht facilities inadequate for modern missions (e.g., tank maintenance in horse barns), and lost records and inaccurate information (maps, plans, utility data,...) causing added planning concern and activity.

German civilian unease concerning proximity to military communities, servicemen, and American life styles, and fear of nuclear confrontation, causing adverse citizen reaction and host nation delays of project approval.

Organization

The U.S. Army, Europe (USAREUR) contains approximately one-half the Army's fighting strength. USAREUR is on a brink-or-war footing, with full scale alerts monthly. A 2-hour mobilization requirement, complicated by dispersion of installations and communications problems related to the old Wehrmacht telephone system, results in troops being confined as virtual prisoners.

The facilities program development chain is Installation to Community to Major Subordinate Command (MSC) to Major Army Command (MACOM). A community is a self-sustaining cluster of installations (averaging 18) at the tactical brigade or division level. The MSC is Army Corps level and the MACOM is Headquarters, USAREUR (HQUSAREUR).

While the U.S. Army Engineer Division, Europe (EUD) interacts with community DEHs in much the same manner as CONUS District Engineers interact with installation Directors of Facilities Engineering (DFAEs), there are qualitative differences arising from the overall European environment.

Primary EUD interaction with HQUSAREUR is through the Deputy Chief of Staff, Engineer (AEAEN). AEAEN receives some support from an affiliated organization, the Installation Support Activity, Europe. Force modernization is managed within the Office of the Deputy Chief of Staff, Operations. A military programming office which validates logistic construction requirements is located within the Office of the Chief of Staff, Logistics.

Commonly (HQUSAREUR, DEH offices, EUD, and elsewhere), continuity of personnel is through uncleared local nationals. Classified information must be scrubbed before passing it on to local nationals. U.S. military and civilian personnel serve short tours of approximately three years, often spending the first half of the tour in one position and the second half in another. Learning time to become reasonably proficient within a position reduces effective time on a job to as little as one year.

Generally, high morale and intense, productive, effort on the part of EUD offset a complex, heavy workload and a host of adverse circumstances peculiar to Europe. Consequently, an analysis of active CONUS and EUD projects indicates that EUD execution averages 2 months less than CONUS. More important to USAREUR, EUD delivery averages 7 1/2 months earlier than CONUS.

The EUD foci of the facility delivery process are the project management and contract administration branches, in the engineering and construction

divisions, respectively. The effect of long execution times and of staffing is evident in the number of projects an individual must manage. In Army Section, for example, the average number of projects per manager is 15, with a maximum of more than 30. Also, project management must meet extra demands that arise from EUD's performance of both division office and district office functions. There are the usual problems of disciplining the entire process, particularly engineering support services, and corrective measures have been taken or planned. Further, EUD execution is affected by late decisions, and therefore, EUD is not motivated to act until programs appear relatively firm. The whole situation contributes to a high burnout rate of project managers, a highlevel of crisis management, and a disincentive for establishing standards and measuring performance against those standards.

It may be concluded that if the MCA cycle is streamlined, the apparently superior advantage that EUD enjoys in project execution and delivery (relative to CONUS) may vanish, in view of European-specific complicating factors.

Local Considerations

Local (political) concern/opposition is a problem, especially for nuclear weapons siting, health and safety (e.g., ammunition storage and removal), environmentally sensitive projects (e.g., noise), intensified land use/growth in crowded areas, utilities load increase, historical artifacts, and tree cutting. Utilities are posing increasing problems as Germans are becoming generally unwilling to absorb additional utility loads. For example, new construction on existing kasernes invariably requires upgrading of local sewer lines or systems prior to FRG approval of a construction contract. The FRG cannot be insensitive to the electorate. These problems do not differ significantly from similar problems in the U.S., except as to degree. They are intensified in Europe, because of the longer time consumed by planning communication, review, resiting, and other factors.

Climate

Construction funds received at the onset of severe winter weather are not helpful. Recall that southernmost Germany is north of the contiguous 48 states and that Congressional appropriations are made in mid-November to mid-December. This may influence the inordinately long advertisement and award times, an EUD-weighted average of 187 days, as compared with a CONUS average of 117 days. The weighted-average target time is 72 days. However, an examination of source data does not reveal a concentration of EUD Spring awards. More than 60 percent of the awards coming in late September. Confusing the whole issue is an average 1 year design slippage.

FOOTNOTE (PAGES 73-75)

APPENDIX C

[1]DA. MCA Cycle Study. Ways to Shorten the MCA Cycle CERL, September 1981, p. 2-7.

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FOOTNOTES (PAGES 77-79)

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[1]Facilities Support Plans are being developed by USACE to support new systems and organization modernization facility requirements planning.

[2]Material Fielding Plans are developed by each PMO which represents a definitive statement of requirement between the systems acquisition command (agent is PM) and the gaining MACOM (e.g., TRADOC, FORSCOM, USAREUR, etc.).

[3]System Descriptions are developed by each PMO for system under development.

GLOSSARY

AAA	Army Audit Agency
ABE	Army Budget Estimate
ACE	Assistant Chief of Engineers
ACP	Army Capabilites Plan
ADP	Automated Data Processing
AFMCO	Army Force Modernization Coordination Office
AMIM	Army Modernation Information Memorandum
AG	Army Guidance
AR	Army Regulation
ARMY 90	Army modern configuration which will include weapons modernization and reorganization (Div 86, Corps 86, etc.) to meet Airland Battle 2000 doctrine
ARSTAF	Headquarters, Department of Army Staff
ASARC	Army Systems Acquisition Review Council
BCE	Baseline Cost Estimate
BEG	Budget Estimates Guidance
BER	Budget Execution Review
BOD	Beneficial Occupancy Date
CE	Corps of Engineers
CERL	Construction Engineering Research Laboratory
CG	Consolidaterd Guidance
COB	Command Operating Budget
COE	Corps of Engineers
CONUS	Continental United States
CRRC	Construction Requirements Review Committee
CSA	Chief of Staff, Army
DA	Department of the Army
DARCOM	U.S. Army Material Development and Readiness Command
DCSOPS	Deputy Chief of Staff for Operations and Plans
DCSRDA	Deputy Chief of Staff for Research Development and Acquisition
DEH	Director of Engineering and Housing-Army community or post agent responsible for operations, repair and maintenance of real property.
DIVAD	SGT York-Air Defense Gun System
DOD	Department of Defense
DSARC	Defense System Acquisition Review Council
DSMC	Defense Systems Management College
DSS	Directed Stationing System-Subsystem of IFS computer program to meet facilities requirements and data base stationing developments
EAC	Echelon Above Corps
EUD	U.S. Army Engineer Division, Europe

FHMA	Family Housing Management Account
FMMP	Force Modernization Master Plan
FMMRS	Force Modernization Milestone Reporting System
FSP	Facility Support Plan
FY	Fiscal Year
FYDP	Five Year Development Program
GAO	Government Accounting Office
HQDA	Headquarters, Department of the Army
IFS	Integrated Facilities System-Computer Program to support facilities/installation operations and planning activities
ILS	Integrated Logistic Support-Process designed to assume effective and economical support of material, before and after fielding.
JIEP	Joint Intelligence Estimate/Plan
JPAM	Joint Program Assistance Memorandum
JSAM	Joint Security Assistance Memorandum
JSCP	Joint Strategic Capabilities Plan
JSPD	Joint Strategic Planning Document
JSPDSA	Joint Strategic Planning Document Support Analysis
LCC	Life Cycle Cost
LSA	Logistic Support Analysis
LSAR	Logistic Support Analysis Record
LSP	Logistic Support Plan
LSR	Logistic Status Review
MACOM	Major Command
MCA	Military Construction Army-Funding Appropriation
MERADCOM	U.S. Army Mobility Equipment Research and Development Command
MFP	Materiel Fielding Plan-Coordinated PM (DARCOM) MACOM plan for new system fielding
MFT	Materiel Fielding Team-PM team to ease transition of new equipment to MACOM
MILCON	Military Construction
MIS	Management Information System
MLRS	Mobile Launch Rocket system
MRIS	Modernization Requirements Information System
MS 0	Milestone 0 - Decision point in systems acquisition process at Start of Concept Exploration Phase
MS I	Milestone I - Decision point at start of Demon/Val Phase
MS II	Milestone II - Decision point at start of Full Scale Development Phase
MS III	Milestone III - Decision point at start of Production Phase

NATO	North Atlantic Treaty Organization
NATO Infrastructure	Fund source for joint NATO program
OASA	Office, Assistant Secretary of Army
OASD	Office, Assistant Secretary of Defense
OCE	Office, Chief of Engineers
OCONUS	Outside, CONUS
ODAS	Office, Director of Army Staff
ODCS/ENGR	Office of the Deputy Chief of Staff Engineer (HQUSAREUR)
OMA	Operations and Maintenance, Army
OSD	Office of Secretary of Defense
PABE	Program and Budget Estimate
PAE	Program Analysis and Evaluation
PARR	Program Analysis and Resource Review
PATRIOT	Air Defense System
PBG	Program Budget Guidance
PDM	Program Decision Memorandum
PM	Program, Project Manager
PMO	Project Manager's Office
POM	Program Objective Memorandum
PPBES	Planning, Programming, Budgeting and Execution System
PPBS	Planning, Programming and Budgeting System
QOL	Quality of Life-living and working conditions of soldiers
RDTE	Research, Development, Testing and Evaluation
RPMA	Real Property Maintenance Account
TRADOC	U.S. Army Training and Doctrine Command
TSM	TRADOC System Manager
UET/M9/ACE	Universal Engineer Tractor/Army Combat Equipment
USACE	United States Army Corps of Engineers-MACOM of U.S. Army
USAREUR	U.S. Army, Europe
UH-60	Blackhawk helicopter system
USA	Under Secretary of the Army
VCSA	Vice Chief of Staff, Army
1391	DOD Form 1391: FY 19__ Military Construction Project Data

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